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ALTERNATIVE CONCEPTIONS OF COMPLEXITY:
SOCIOPOLITICAL DYNAMICS OF THE MOUNTAIN FORK CADDO

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF ANTHROPOLOGY

BY

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Abstract

The Mountain Fork Caddo lived along the Mountain Fork River in southeastern Oklahoma between approximately A.D. 1000 and 1600. These dispersed, sedentary communities shared much in common with other southeastern peoples, including maize production and the construction of earthen mounds. Unlike some southeastern societies, though, little evidence for status differentiation or a strongly hierarchical sociopolitical structure is present among the Mountain Fork society. This dissertation develops an alternative model for understanding the sociopolitical dynamics of the Mountain Fork Caddo by conducting a detailed analysis of site chronology, social identity, and leadership in ritual contexts. It uses a data set drawn from the six significant excavations in this valley at the Ramos Creek, Woods Mound Group, Hughes, E. Johnson, Beaver, and Biggham Creek sites, focusing primarily on three main forms of evidence: pottery, radiocarbon dates, and paleobotanical samples.

The two mound sites, Woods and Biggham Creek, represent significant ceremonial places that are excellent venues for studying the intersection of social practice, political leadership, and ritual practice. This dissertation shows that these sites were occupied sequentially and that they were characterized by distinctly different social practices, interpreted as demonstrating a shift towards more specialization and centralization of leadership roles in the fifteenth century. Concurrently, the Mountain Fork communities shifted towards the south, abandoning sites in the northern part of the drainage and developing more ties with communities along the Little and Red Rivers. This dissertation argues that the development of particular archaeological histories is critical for understanding variation in small-scale societies and how those societies articulated with the broader world.

Foreword: *Tayshas*

This study addresses the archaeological history of the Mountain Fork Caddo, who were ancestral to the contemporary Caddo people. Because of the significance of the Caddo to my research and life, and because of the importance of relationships between archaeologists and indigenous peoples, I am beginning my dissertation with a brief essay on my own relationship with the Caddo. While not a traditional beginning to a dissertation, it sets the stage for studying and appreciating the unique history of the ancestral Caddo and its effect on the lives of their descendants.

I focus largely on two ritually-significant places along the Mountain Fork River: Woods and Biggham Creek. Both Woods and Biggham Creek were marked as significant places on the landscape, marked by mounds and meant to be remembered. Mound sites play an important role in the social memory of the contemporary Caddo. Mounds evoke strong feelings among Caddo people of all ages, reflecting shared feelings on the significance of these historic places (Caddo Nation Repatriation Committee and Caddo Nation Cultural Preservation Office n.d.). Although the Caddo diplomatically dealt with French and Spanish incursions into their homelands into the nineteenth century, a combination of severe population loss from disease, westward movement by the Americans, and incursions by other tribes finally forced them from their homes (Barr 2008; Carter 1995; Perttula 1992). The Caddo persevered in maintaining their language and culture, but more than a century of marginalization and assimilation took a toll. Many Caddo people today actively work to maintain, preserve, and share their heritage, both material and immaterial, and archaeologists have a role to play in that effort.

Relationships between archaeologists and indigenous peoples have a rocky history steeped in colonialism and misunderstanding (Haber and Gnecco 2007; Smith 2005; Watkins 2000, 2005; Zimmerman 2006). Strides have been made recently towards recognizing the historical and contemporary inequities that shape relationships between archaeologists and indigenous peoples. Essentially, although archaeological research is valued by Europeans and Euro-Americans for its contribution to our knowledge of all of humanity, it has often been conducted with disregard for those whose history is being analyzed. Today laws such as the Native American Graves Protection and Repatriation Act (NAGPRA) and the 1992 amendment to the National Historic Preservation Act (NHPA) help restore some power to federally-recognized American Indian groups to manage their own cultural heritage. Additionally, any work in the United States that takes place on federal lands or is federally-sponsored requires consultation with federally-recognized tribes whose cultural heritage might be affected.

These laws, while important, are not a panacea for relations between American Indians and archaeologists. Individual archaeologists can also help improve relations by making good-faith efforts to interact with descendant populations. Indeed, this has now become expected in the course of conducting ethical research. A continuum of different sorts of interactions exist, from federally-mandated consultations through full-scale collaboration in research planning and implementation (Colwell-Chanthaphonh and Ferguson 2008; Watkins and Ferguson 2005). Interactions also include both government-to-government level consultations and more informal personal relationships between individuals. Every situation is different, depending on the goals of a project, the history of previous research and relationships, and the institutions, tribes, and individuals involved. Sometimes forming and maintaining the relationships necessary for consultation or collaboration can be frustrating for both archaeologists and indigenous people and there is no one-size-fits-all template for this process. Forming these partnerships – and friendships – in good faith, however, is beneficial for all involved in the long run.

Developing relationships with the Caddo people has benefited my own research, and I hope that it will also benefit them. I have formally consulted with the Caddo Nation, particularly in relation to NAGPRA with a request to study the burial vessels from E. Johnson and Beaver, which they graciously granted. Before beginning my dissertation research, I consulted with Bobby Gonzales, the Caddo NAGPRA coordinator, and Robert Cast, the Caddo Tribal Historic Preservation Officer, about my plans and asked where they saw a need for research in southeastern Oklahoma. They told me that the field was wide open, but asked me to keep them updated on my progress.

I am extremely fortunate to have both friends – *tayshas* – and colleagues among the Caddo. Both elders and young people have expressed interest in my work and welcomed me as a partner in the preservation of Caddo history and heritage. Their kindness has meant the world to me both personally and professionally. Their perspectives on both traditional culture and contemporary issues have enriched my appreciation for the significance of their heritage and the tenacity of the Caddo people in preserving that heritage.

Archaeologists working in the Caddo area find themselves in a relatively unique position. Most of the Caddo no longer live in their homeland, having been driven out of Texas and into Indian Territory in the nineteenth century (Carter 1995). Tribal headquarters today are in Binger, about 65 miles west of Oklahoma City, and many Caddo people live in Binger, Anadarko, and the greater metropolitan area. They have active cultural organizations including the Hasinai Society and the Caddo Culture Club, which now has a metro branch. The Caddo Nation and Caddo people also host numerous dances throughout the year, at the tribal headquarters, nearby at the Murrow family dance grounds, and in Norman.

Notably members of the Caddo Nation also attend the annual Caddo Conference, a gathering of archaeologists, historians, and others interested in Caddo history and heritage. This wonderful gathering ensures that archaeologists and the Caddo people regularly exchange ideas and perspectives in a respectful and friendly atmosphere. All of our differences are not worked out here, but at least we are made aware of each other's presence and concerns. Although differences in the approach we take to history are clear, most parties tend to try to emphasize partnership. The conference closes with a series of dances, starting with the ceremonial Turkey Dance. After the Turkey Dance is complete, archaeologists and local visitors are encouraged to join in the social dances, giving us the opportunity not only to study Caddo culture but to share it and to learn by experience.

My first Caddo Conference was in Natchitoches, Texas. The chairperson at that time was LaRue Parker, who just passed away this last year (2011). She opened the conference with a warm greeting, a stern warning that we must continue to respect her ancestors and her people, and a prayer, setting the tone I would come to know well when interacting with the Caddo. Since then I have met numerous other elders and younger people at both the Caddo Conference and at dances in Binger and Norman. These people, *tayshas*, colleagues, and acquaintances, have enriched my work and my life.

Partnership and friendship is a two-way street. My research has benefited through working with the Caddo, and in return I feel a responsibility to use my work to assist in the preservation of Caddo heritage. To that end I am planning a travelling exhibit based on my dissertation research. This exhibit, which will be created in collaboration with the Caddo Nation, has three goals: (1) to increase public understanding of Caddo history and culture, (2) to increase public knowledge of archaeological methods, and (3) to promote archaeological stewardship and cultural understanding by emphasizing continuities between the past and the present and between cultures.

In recent history southeastern Oklahoma has been home to the Choctaw Nation and to non-indigenous peoples of multiple ancestries and ethnicities. Several times during field research in that area I have heard quotes along the lines of "Who were the Caddo?" People do recognize their pottery, however – looting is sadly rampant, though decried by many. Archaeology can play a critical role in at least educating people in the traditional Caddo homeland about the Caddo of the past and present, highlighting the richness of their history in the deep past by filling in the details of their daily lives, developing a narrative of their history in particular places, and documenting the depth of their traditions and how those traditions are carried on in the present day. I want to encourage people to think about similarities between the lives of the ancestral Caddo, the lives of Caddo people today, and their own lives by focusing on three topics to which everyone can relate: food, home, and social life. By enlivening the past and connecting it explicitly to present-day life, I hope to promote dialogue about cultural heritage and preservation.

I conclude by calling attention to the meaning of cultural heritage to the contemporary Caddo, revisiting the significance another cultural icon with ancient roots: the *Itcha kaa-*

nah, or “that kind of pole”, used for healing and spiritual communication in the early twentieth century. Years after the pole was used in the Ghost Dance, it was taken to Oklahoma Museum of Natural History, where it still is today. Grace Akins and her daughter Madeline visited it shortly before Grace died, and seeing it in storage had a tremendous impact on her (Carter 1995:97). Through all of our archaeological investigations of the past, it is important to revisit the meaning of our work and our artifact collections on the people of the present day. I have had the privilege to meet and dance with Grace’s daughter Madeline and with her granddaughters, and I hope to continue learning from her family and my other friends about the Caddo of both the past and the present.

Chapter 1: Introduction

The Caddo are an American Indian people whose ancestors lived in the region where present-day Oklahoma, Arkansas, Texas, and Louisiana conjoin. Emerging as an archaeologically-distinct culture by around A.D. 1000, the ancestral Caddo were the westernmost society of the Eastern Woodlands. They shared a number of characteristics with other Mississippian societies, including maize (corn) farming, some similar cosmological beliefs, and the construction of earthen mounds. When the Spanish and French came to the Caddo homeland in the seventeenth and eighteenth centuries, they found communities with hierarchical governance systems with hereditary leadership positions. This form of sociopolitical organization looked similar to that observed for other indigenous societies in the American Southeast, which have commonly been labeled as chiefdoms in the archaeological and ethnographic literature.

Because of the ethnohistoric record and the apparent similarities between the Caddo and other Southeastern peoples, archaeologists have commonly drawn on chiefdom models of sociopolitical organization to interpret the archaeological record in the Caddo area. These models have encouraged archaeologists to focus on identifying evidence of hierarchical or ranked relationships between communities and individuals, sometimes leading them to focus on large sites with elaborate architecture. This approach tends to over-privilege the role of strongly hierarchical societies in human history, though, and to neglect the intricacies of human social interactions at different scales of organization. Hierarchical models of sociopolitical organization are useful for understanding some societies, but they can hamper our interpretation of the diverse organizational forms and social histories whose existence is implied by the archaeological record.

In the Caddo archaeological area and in the broader Southeast, researchers have begun to focus more on documenting and explaining the tremendous variation that existed among and between different societies. Although the large mound sites, centers of ritual and political activity, continue to attract well-deserved attention, recent studies of smaller sites and smaller-scale societies have made valuable contributions toward our understanding of organization diversity and the richness of social relations among everyday people, not just the elites. Additionally, researchers studying a diverse range of societies have recently directed attention to the role of ideology, ritual, and religion in relation to leadership roles and strategies.

Contributing to the ongoing debates on the complexity of middle-range societies, this project develops a nuanced model of sociopolitical dynamics among the ancestral Caddo people who lived along the Mountain Fork River in southeastern Oklahoma among the Ouachita Mountains. These communities lived in dispersed communities along a 27 kilometer stretch of the Mountain Fork from around A.D. 1000 to 1600. This study draws on collections from six sites, five that were excavated prior to reservoir construction in the 1960s and one where limited excavations were conducted during a recent field school. These include two sites with small earthen mounds, Woods and Biggham Creek, and four non-mound residential sites, Ramos Creek, Hughes, E. Johnson, and Beaver.

In order to study the sociopolitical dynamics of the Mountain Fork Caddo, this project had three major research objectives. The first goal was to analyze the chronological sequence of site occupation as a first step toward understanding the pattern of settlement. The second objective was to investigate social identity, examining relationships among contemporary sites within the valley and connections with neighboring regions in order to trace social integration and political affiliations through time. Finally, the third objective was to explore the intersection of political leadership and ritual practice as expressed at the two mound sites by examining evidence for inclusive versus exclusive activities and for status differentiation at these ritually-charged places. In tandem, the results of these research goals provided a richly-textured archaeological history of the sociopolitical dynamics in this valley, enlarging our understanding of organization, leadership, and ritual practices among the ancestral Caddo.

I begin in Chapter 2 by reviewing models of sociopolitical dynamics in middle-range societies, focusing particularly on archaeological models in the American Southeast and on ethnohistoric models for the Caddo. Chapter 3 describes archaeological research along the Mountain Fork, looking at the local environment, geology, sites, and recent paleobotanical research.

Chapter 4 addresses the theoretical background of stylistic studies in archaeological research, looking at how pottery has been used to study social relationships. This sets the stage for Chapter 5, where I describe the character of the pottery assemblages from the six sites in this study through the analysis of nearly 12,000 sherds and 43 whole vessels. In Chapter 6 I use the pottery and a series of radiocarbon dates to address the questions of chronology and social identity, identifying a shift in occupation, extra-regional affiliation, and ritual focus in the fifteenth century. I also compare the pottery assemblages between the two mound sites, identifying significant differences. In Chapter 7 I interpret these differences with respect to the activities that took place at these sites and their relationship to changes in leadership and sociopolitical organization, in conjunction with broader trends across the Caddo area.

Chapter 2: Models of Sociopolitical Dynamics

Archaeologists have long been intrigued by the people who built earthen mound sites throughout the southeastern United States. Because mound sites are plentiful, sometimes impressive in size, and reflect social action in the construction of culturally-significant places, a high value has been placed on their interpretive potential for understanding the sociopolitical organization of ancestral American Indian societies. Although archaeologists agree that mound sites are an important line of evidence for studying political centralization and ritual practices, they debate appropriate theoretical frameworks and scales of inquiry. Neo-evolutionary models in particular have come under critique for privileging the role of large sites and political elites at the expense of understanding the diverse factors and processes at play in middle-range societies. Whereas large mound sites such as Cahokia, Moundville, Etowah, and Spiro have attracted much well-deserved attention, many archaeologists argue that focusing on smaller mound sites and other types of settlements is crucial for exploring the potentially diverse sociopolitical processes and histories that shaped southeastern societies over time (Blitz and Livingood 2004; Clay 2006; Hammerstedt 2005). Archaeologists are currently concerned with identifying organizational diversity in middle-range societies across the Southeast and examining the reasons for that diversity (Blitz 2010).

Based on ethnohistoric analogy and archaeological evidence many Mississippian societies have been classified as chiefdoms, which Livingood (2010:4) has defined as "societies with some degree of multigenerational centralized and hierarchical political authority and territorial integration but lacking rigid social classes or an elaborate bureaucracy." This neo-evolutionary stage has been criticized for glossing over both organizational variation and diachronic complexity (Feinman and Neitzel 1984; Fowles 2002; Yoffee 1993). It has also been over-used, especially during an earlier time when almost every mound site was interpreted as the political center of a chiefdom. It is a useful and probably accurate descriptive term for many Mississippian societies, however, and it also helpfully sets a baseline against which to compare other organizational forms.

A variety of new perspectives on complexity and social theory have recently influenced interpretations of southeastern societies (Brown 2007; Crumley 1995; McGuire and Saitta 1996; Saitta 1997; Wolf 1999). Traditionally archaeologists have been concerned with interpreting the degree of hierarchy and centralization in southeastern societies using evidence related to scale, settlement patterns, differentiated status, and labor organization. While these lines of evidence are still important, we have started to focus more on relationships between potentially unranked segments of society, leadership strategies, the role of ideology, and on historical change. These concerns have started to give us a richer understanding of sociopolitical dynamics in the middle-range societies of the Southeast (Beck 2003, 2006; Blitz 1999; Brown 2006; King 2003, 2004; Maxham 2000; Welch 2006).

Although some of these concepts have been integrated into archaeological studies in the Caddo area, others have not yet been widely considered. Although the Caddo were culturally unique in some ways, they also shared much in common with other southeastern societies, including maize cultivation, platform mound construction, and similar iconographic imagery (Dowd 2011a; Early 2004; Lankford 2004; Perttula 1996). Additionally, as with other southeastern societies, Caddo societies traditionally have been characterized as highly ranked, with several levels of religious and political offices, and historic Caddo societies have been classified as chiefdoms (Perttula 1992; Sabo 1998; Tanner 1993; Wyckoff and Baugh 1980).

This model of political-religious hierarchy works relatively well for some places, but is clearly insufficient for explaining the archaeological history of the Mountain Fork communities. Little evidence for political hierarchy or socioeconomic differentiation exists in this valley. Two mound sites existed here, one with eight mounds and one with two, but the mounds were small buried structure mounds that were quite different from the platform mounds typically associated with Mississippian chiefdoms. These buried structure mounds were less than a meter high. In each case among the Mountain Fork mounds, a structure was built, sometimes on an initial layer of earth. Then it was burned or deconstructed, and finally covered with another layer of earth. In terms of labor investment, these were not very impressive. The buried structure mounds indicate that ritual activities were important here. Buildings were sometimes buried in the Caddo area, but not frequently. Because most structures were not treated in this manner the acts of burning and burial very likely had symbolic significance (Brown 1996:169-172; Kay and Sabo 2006; Rogers 1982; Trubitt 2009). It is unclear exactly what role these ritual practices played in this valley's sociopolitical dynamics. No status differentiation can be seen in the mortuary data, nor have any exotic prestige goods been found. Regarding economic control, I will argue later that maize was cultivated primarily for household consumption and that leaders could not depend on the manipulation of communal maize surpluses. There is simply not much evidence along the Mountain Fork for political centralization or hierarchy.

However, the lack of evidence for centralization or hierarchy in a landscape marked by ritual mound construction makes the Mountain Fork Caddo that much more interesting, suggesting several avenues of research. Regarding political organization, if these communities comprised an integrated polity, what forms of leadership were practiced? Also, mound construction, even of small buried structure mounds, likely also had political significance; thus the presence of two mound sites might also indicate competing interests or a shift in the placement of ritual and political focus over time. Additionally, the Mountain Fork communities lay between several other societies, including other Ouachita Mountain communities to the east and those along the Little and Red Rivers to the south. It is uncertain how these different communities and societies were socially allied or otherwise connected. I argue that an alternative model of sociopolitical organization is needed for this valley along with an historical analysis of social change during the period of Caddo occupation.

This project will address the questions of social integration, political leadership, the intersection of ritual and political practices, and historical dynamics along the Mountain Fork. My goal is to create a detailed history of the valley's sociopolitical dynamics. In this chapter I begin by discussing the historical development of influential models of sociopolitical organization for middle-range societies and critiques of those models. Next, I examine different archaeological studies of sociopolitical organization in the Southeast, reviewing a range of approaches to identifying different dimensions of complexity. I highlight lines of evidence and perspectives that might be particularly applicable to the Mountain Fork. Then I evaluate models of sociopolitical organization for Caddo societies, assessing both the ethnohistoric record and archaeological evidence for analogies that may assist in the interpretation of sociopolitical organization along the Mountain Fork.

Influential Models of Sociopolitical Complexity for Middle-Range Societies

Anthropological models of sociopolitical complexity have a long history, extending back to the nineteenth-century studies of Morgan (1865) and Tylor (1958[1871]). Their evolutionary schemes conflated ethnographic and archaeological studies, placing all known societies on scales that ranged along a single axis from least to most civilized (with, of course, modern European industrial societies at the very top of the evolutionary ladder). Evolutionary theory appeared again in the neo-evolutionary studies that greatly influenced archaeologists who studied middle-range societies, including those who worked in the American Southeast. White (1949) proposed the concept of general evolution. He suggested that societies around the world were all gradually progressing from less complex to more complex forms (sociopolitically). Steward (1955) proposed the idea of multilineal evolution, which recognized that different paths to changes in complexity might exist. This idea proved to be highly influential and was drawn on by later archaeologists including Price and Brown (1985) and Earle (1987, 1991).

The chiefdom concept was first developed by Oberg (1955), who named the chiefdom as a type of society based on his ethnographic studies of groups in South and Central America. Oberg characterized chiefdoms as polities with a leader (chief) who controlled a multi-village territory and who had a hierarchy of lesser chiefs under him. Thus the concept of hierarchical leadership became associated with the chiefdom. Although the chiefdom has since received much criticism as an evolutionary stage and as a unified concept, it is still generally considered a basic form of sociopolitical organization.

Service (1962) embedded the chiefdom within his neo-evolutionary typology of band-tribe-chiefdom-state, basing these different stages of social evolution on ethnographic cultures. He identified chiefdoms by the presence of an economic, political, and religious center within a territory, lead by chiefs who played a managerial, redistributive role. Service (1962:134-136) believed that chiefdoms spanned ecological zones, in which different communities would specialize in different forms of production. The chiefs centrally gathered the products of different communities and redistributed them across the populace. Service also noted that chiefdoms had a permanent office of leadership and an administrative apparatus.

Willey and Phillips (1958) were influenced by neo-evolution in their construction of different stages that all archaeological cultures had progressed through in the Americas (pre-formative, formative, etc.) These ideas were used by Southeastern archaeologists, particularly those who studied Mississippian societies, to compare formative “chiefdoms” in the Southeast to each other and to other formative societies in the Americas. Similar social processes were assumed to be at work within each stage.

Ethnographic research also lead to Sahlins’ (1961) identification of the segmentary lineage system, which he described as an alternative means of achieving the large-scale integration of tribal societies without having a permanent office of leadership, namely the segmentary lineage system. Based on his work among the Nuer and the Tiv, he suggested this as an alternative form of sociopolitical organization. Fried (1967) proposed a different scale for measuring the complexity of societies by examining social relationships related to inequality, leading to the development of a four-stage typology of egalitarian, ranked, stratified, and state societies.

Challenges to the Early Neo-evolutionary Models

The universality of Service's redistributional chiefdom model was directly challenged by Earle (1977). Whereas Service (1962) suggested that different communities within chiefdoms were located in different ecological zones, Earle found that in Hawaiian chiefdoms communities actually cross-cut ecological zones. Easy access to multiple zones under-cut the need for a chief to redistribute goods across society (not to mention the fact that the people were probably perfectly capable of organizing the exchange of basic goods on their own). Earle proposed that instead of engaging in redistribution, the chiefs were actually engaging in self-aggrandizement through the collection of tribute. The general populace may have benefited from this practice if the surplus tribute was used to assist the population in times of famine, for capital improvements, or was seen as supporting the elite members of society in their roles as ritual specialists. However, this viewpoint could also be seen as the imposition of elite ideology to justify tribute collection and the maintenance of social stratification.

Feinman and Neitzel (1984) also used ethnographic studies, reviewing societies throughout the Americas to see whether the suites of attributes used to characterize chiefdoms actually co-occurred. They found only a very limited number of attributes that did co-occur, suggesting that far more structural variation in middle-range societies was present than had been previously acknowledged. Their findings suggest that we need to decouple measures of complexity when looking at the archaeological record and avoid interpreting an overall state of sociopolitical organization from a single line of evidence (Livingood 2010:17).

In the 1970s and 80s more archaeologists started to consider how sociopolitical complexity in middle-range societies developed in the first place and how it was maintained. Carneiro (1981) proposed that chiefdoms formed through one community's use of force (or threat of force) against others within an environmentally- or socially-circumscribed region. While this may help explain the sociopolitical integration of some societies, such as in Peru, most anthropologists now consider a universal prime mover unrealistic (Chapman 2003; Trigger 1998). In contrast, Price and Brown (1985) took a multi-causal approach to explaining the development of sociopolitical integration, proposing a variety of possible internal and external factors. Their work represents systems theory at its best.

Earle (1987, 1991) continued this line of thought, recognizing multiple influences on the development of sociopolitical complexity, including economic and ideological causes. He characterized chiefdoms by three measures: 1) the scale of integration, 2) the centrality of decision making, and 3) the degree of hierarchy. In addition, he noted three processes by which leaders acquired power: 1) through the control of staple production, 2) through control over the distribution of rare goods, and 3) through control via conquest. Earle (1987, 1991) identified warfare, economic control, and ideology as primary mechanisms by which chiefs acquired and maintained power.

Regarding the maintenance of complexity, Renfrew (1974) was one of the earlier archaeologists to recognize variations in chiefly leadership strategies. Based on his studies of the Aegean, he distinguished between individualizing and group-oriented chiefdoms. Within individualizing chiefdoms great disparities in wealth were apparent, hierarchies between leaders and followers were emphasized, and little evidence existed for large-scale communal activities. Within group-oriented chiefdoms, on the other hand, wealth disparities were flattened and communal activities were common. Although Renfrew seemed to be taking a type-based approach to classification, he was really interested in social processes. Blanton and colleagues (1996) expressed basically the same division using a different vocabulary based on their studies of Mesoamerica when they distinguished between corporate vs. network strategies of organization. Leaders who practiced network strategies focused on their connections with other leaders and maintained a strictly hierarchical form of governance. Again, evidence for network organization includes large disparities of wealth and an emphasis on individual leaders. Corporate strategies involved a dispersal of power and placing more emphasis on group activities, leaving evidence for large-scale undertakings but less evidence for wealth disparity.

Researchers studying complexity soon began to expand their focus to long-term historical processes as well as short-term strategies and middle-range social processes. Wright (1984), basing on his archaeological research in southwestern Iran, suggested that chiefdoms in this region had once cycled between simple and complex forms over time as leaders acquired power and were later overthrown. He defined simple chiefdoms as polities composed of one level of hierarchical leadership above the community, whereas complex chiefdoms had two to three levels of leadership above the community level. Wright's (1984) recognition that complexity did not necessarily increase over time was quite important.

Yoffee (1993) argued that archaeologists should pay more attention to different possible trajectories of tribal, chiefly, and state societies rather than assuming that each type grew successively out of the other in a single evolutionary track. This line was taken further by Adams (2001), who strongly encouraged archaeologists to consider the issues of tempo (pace of change) and historical contingency. He suggested that the combination of different sequences of processes and events might lead to path dependency, in which the particular trajectory of a society became "locked in" following a historically contingent event of set of conditions. Fowles (2002) also contributed to the focus on historical process by making a strong case for studying the trajectories of tribal societies at different temporal scales, by examining the intersection of structure and agency in shaping intra-generational, multi-generational, and long-term processes.

Alongside the new emphases on leadership strategies and diachronic processes, some researchers (Crumley 1995; McGuire and Saitta 1996; Saitta 1997) in the 1990s started questioning archaeologists' pervasive focus on hierarchy and chiefly coercion within middle-range societies. The largest sites and presence of exotic artifacts were often interpreted as evidence for powerful polities and high-status leaders. It became apparent, however, that not every site with monumental architecture implied the presence of a coercive chief and cowed labor force and that different configurations of ranked and unranked relationships might exist in middle-range societies otherwise classified as chiefdoms.

Crumley (1995) helped introduce the concept of heterarchy. Heterarchical relationships are those which may or may not involve ranking and social inequality, or in which inequality may be a fluid or not readily apparent quality. Heterachical relationships can involve degrees of hierarchy, but also include relationships between (sometimes) unranked entities, such as genders, moieties, clans, or households. McGuire and Saitta (1996; Saitta 1997) picked up on the concept of heterarchy in their archaeological studies of middle-range societies in the Southwest. They suggested that different forms of equality and inequality could co-exist within these societies. They proposed the concept of the communal society. Within a communal society, everyone had access to some portion of social entitlements, but not everyone had equal access. They also suggested that political leaders and ritual specialists within these societies could be considered as part of a communal subsumed class that earned the right to more entitlements by maintaining the social means of production. This interesting neo-Marxist theory recalls Earle's (1977) ideas about why commoners were willing to give tribute to elite leaders.

Exploring the roles of different leaders within middle-range societies and the relationships between leaders and followers necessitates thinking through the means by which leaders achieve and use their power. The major anthropological work on this subject was written by Wolf (1999), who distinguished four major forms of power. Three of these forms, including personal dominance and the tactical control an individual or faction holds over labor and other resources, whether implicit or actualized, involve an inequality between individuals, factions, or classes. These forms of power are exercised relatively explicitly and often involve direct coercion or domination. The fourth form, which Wolf called structural power, has more to do with the ability of someone to control the social agenda through ideological manipulation. This form of power is linked to the others, in that someone with personal charisma or tactical advantages is more likely to be able to control what people think. For example, corporations with the tactical advantage of money can buy advertising time and weave narratives that suit their own political purpose. Wolf (1999) found it a meaningful concept for exploring why people seem to buy into certain large-scale social and historical occurrences (for an extreme example, Nazi Germany) when it might otherwise be against their interests.

Wolf's (1999) conceptualization of structural power is directly related to Gramsci's (1971) contrast between direct domination exercised by the state and hegemonic control exercised by civil society, often on behalf of the state. Althusser (1971), Foucault (1977, 1983), and Haraway (1988) are other well-known anthropologists who have explored the relationship between differential power, the production of knowledge, and social ideologies at length in their work. Redman (1991) explored one way by which those in control of resources legitimate their restricted access, through integrative ceremonies designed to generate feelings of inclusion in among the masses.

Working from material remains, archaeologists can readily identify labor investment in the construction of monumental architecture or the production of finely-crafted artifacts. It is easy to interpret these as evidence for a hierarchical society in which someone at the top controls the organization of labor. It is more difficult, but rewarding, to think through the ideological reasons why people accord power to their leaders or put up with differential distribution of resources, especially in relatively small-scale societies where people who are unhappy with their leaders sometimes had the option of migration. By focusing on ideology and integrative practices, as well as political economy, we can expand our understanding of the social processes at work in middle-range societies.

Models of Sociopolitical Organization in the American Southeast

Archaeologists working in the American Southeast have debated the degree and character of complexity in societies spanning the Archaic, Woodland, and Mississippian periods. Monumental architecture has often been used as a proxy for social inequality and political complexity in the Southeast, in conjunction with other attributes including sedentism and agriculture (Griffin 1967). The advent of radiocarbon dating and the discovery that earthen mounds at Watson Brake in the Lower Mississippi Valley dated as early as 5400 B.P. (Saunders et al. 2005) challenged the link between monumental architecture and political complexity. Many other mound sites were also dated to either the Archaic or the Woodland periods, making it apparent that either monumentality was not an absolute indicator of complexity or that some Archaic and Woodland societies were more complex (or complex in different ways) than was previously believed (Gibson and Carr 2004).

The debate over Archaic mounds is emblematic of broader discussions over the interpretation of mound construction and use in southeastern societies. Mound size, the number and arrangement of mounds at a site, mound type, the tempo of mound construction, and site-size hierarchies have all been used as proxies for interpreting sociopolitical organization. Many archaeologists (Lindauer and Blitz 1997; Knight 2001) make a particular distinction between mounds that served integrative versus exclusionary functions, generally identifying Middle Woodland mounds with the former and Mississippian mounds with the latter. Recognition that all Mississippian mounds did not serve the same purpose is now increasing, however (Blitz and Livingood 2004), as is the recognition that small mound sites and non-mound sites deserve more attention (Clay 2006; Maxham 2000; Welch 2006). Caddo archaeologists need to draw on these new perspectives to assess the accuracy and increase the richness of our interpretations.

Other proxy data for studying sociopolitical organization include mortuary evidence, artifact distribution, and subsistence data (Brown 1971a, 1996; Muller 1997; Pauketat 1987, 2003; Peebles and Kus 1977; Prentice 1985; Schroeder 2004; Welch 1991).

Together with mounds, these proxies have been used to interpret polity size, degree of social integration, level of hierarchy, leadership strategies, political economy, ritual economy, and ideology. In this section I will focus first on how interpretations of mound construction and use have informed models of sociopolitical organization. Next I look to settlement pattern studies, highlighting several recent studies that have stressed variability among small-scale sites.

Sacred Places: Mound Construction and Use

Attributes of mound construction have been some of the most common proxies used for studying sociopolitical dynamics in the Southeast. Several different types of mounds exist across the Southeast, including burial mounds, platform mounds, and buried structure mounds. The sizes of mounds, number of mounds at any particular site, and number of construction stages vary widely. For example, some of the smallest mounds are only a meter tall, whereas Monks Mound at Cahokia is approximately 30 meters in height (Fowler 1989).

The first platform mounds appeared in the Eastern Woodlands alongside burial mounds and earthen enclosures during the Middle Woodland starting around 100 B.C. (Knight 2001; Mainfort 1988). These early platform mounds did not have structures on top of them, but instead were commonly topped with dense scatters of postholes, some small and some monumental in scale. Knight (2001), looking specifically at Kolomoki Mound B, McKeithen Mound A, the platform mound at Walling, Cold Springs Mound A, and Garden Creek Mound No. 2, interpreted these postholes as evidence of “scaffolding behavior”, in which people built racks and erected giant poles on which to collect or display food or other objects before a public feast (Jefferies 1994; Keel 1970, 1976; Knight 1990; Milanich et al. 1984; Sears 1951a, 1951b, 1953, 1956). These feasts could help to create and maintain alliances between communities and could also be a source of social prestige and political influence for the host community.

Lindauer and Blitz (1997) proposed that these early platform mounds served a communal, integrative function, using public access as a line of evidence. Platform mounds with structures occurring on their summits finally appeared in the Lower Mississippi Valley at Coles Creek sites starting around A.D. 700 (Knight 2001) and later in other parts of the Southeast. Steponaitis (1986:382-386) interpreted the emergence of summit structures as the appropriation of a sacred space by emergent elites in order to reinforce their authority. Knight (1981, 1986, 1989) drew on ethnohistoric evidence to describe mound construction as an act of ritual purification and world renewal. When the community came together to add a layer of earth to a mound, in effect they buried the mound in a mortuary ritual. Knight interpreted this as invoking fertility, a cycle of life, death, and rebirth inherent to the continuity of the world.

High-ranking corporate groups may have drawn on the cultural metaphor of the mound as a place of world renewal in order to substantiate their claims to power or territory (Steponaitis 1986:382-386). Once the top of a mound was claimed by a particular faction, public access was more restricted. When that happened mounds may still have served an integrative function when undergoing construction, but during the rest of the year created a sense of social differentiation recreated daily through the community members' lived experiences (Cobb and King 2005; Lindauer and Blitz 1997). Mississippian mound construction has been associated with either death of a chief or succession to chiefly office (Anderson 1994, 1996; Hally 1996). At this point mound construction may have still served an integrative purpose, but the metaphor of world renewal was appropriated by leaders to naturalize and legitimate their own authority (King 2003).

Oftentimes political economy models use control over labor or material resources as a proxy for identifying hierarchical leadership within middle-range societies (Anderson 1994; Emerson 1997; Pauketat 2004; Pauketat and Emerson 1997; Welch 1996). These models are most often pertinent to the largest sites and polities. For Mississippian mound sites, Muller (1997) has noted that mound size can potentially be considered a reasonable proxy for control over labor. Debate exists, however, over precisely how many people and how much time were required for mound construction (Milner 1998; Pauketat 1994; Pauketat and Emerson 1997). Blitz and Livingood (2004) found that different tempos of mound construction existed at single-mound sites versus the largest multi-mound sites. Whereas mound construction at single-mound sites tended to be gradual, mound construction at the largest multi-mound sites tended to occur suddenly and irregularly. This implied that the ritual of mound construction probably occurred for different reasons at these different types of sites. Whereas gradual construction was probably associated with periodic ceremonies, perhaps the world-renewal ceremonies proposed by Knight (1981, 1986), sudden and irregular construction was more likely associated with the ascension or death of a political leader. Knowing that small mound sites were qualitatively different from the biggest multi-mound sites, it may be possible to explore the degrees of centralization and hierarchy implied by the reasons behind mound construction. When mound building was a regular, cyclical activity it is entirely possible that little centralized coordination was necessary. Sudden, irregular mound building, though, implies a central organizing power.

Recent years have seen a turn in the southeastern literature towards interpreting leadership roles as inherently religious. Many archaeologists have focused on the role of control of ritual knowledge and ideology rather than economic control for understanding paths to power (Cobb and King 2005; Brown 2007; Pluckhahn 2010; Welch 2006). These models are particularly applicable to smaller-scale societies where it would have been difficult for leaders to gain control over material resources (Cobb and Nassaney 2002:531), but obviously ideology has been invoked in power-plays at every scale of society throughout history. Drawing attention to one's connection to distant or supernatural powers is, after all, a common political strategy (Helms 1998; Tsing 1993).

Starting with smaller-scale societies, Pluckhahn (2010) studied the role of demarcated sacred spaces in the development of early village societies in the Middle Woodland period (approximately A.D. 100 to 500). He first described how sacred spaces such as the plaza and burial mounds at Kolomoki served as facilities for social integration. He also considered how those who coordinated their construction and lead ceremonies gained prestige. Exploring the context of emergent leadership, Pluckhahn (ibid.) proposed that the new division of sacred from domestic space in the Middle Woodland created a new sociopolitical dynamic, in which leadership became simultaneously more hierarchical and yet more limited to particular social realms. As leaders benefited from increased power in sacred settings, the separation of domestic and sacred settings may have served as a mechanism for restricting their prestigious status to the ritual realm.

At the Mississipppian site of Moundville, Knight (1998) interpreted the spatial layout of the site's 29 mounds as a sociogram reflecting the existence of ranked corporate groups, using the historic Chickasaw camp square for ethnohistoric analogy. He suggested that the layout of this ceremonial center was part of a political effort to impose a particular view of social reality on the landscape (Knight 1998:46). Wilson's (2008) recent work supports this interpretation, although looking at the distribution of artifacts he found that ranking was only expressed in ritual contexts and not in the daily lives of Moundville's households. He used this evidence to argue that corporate groups here drew on ritual as a basis of power rather than on economic control.

Brown (1996, 2003, 2006) has explored the relationship between ideology and political power at length, with special attention to Mound 72 at Cahokia and the Great Mortuary in Craig Mound at Spiro. He has interpreted these two burials as cosmological tableaus organized as group-oriented activities to legitimize the status of a particular group through association with the performance. He cites each of these as examples of the exercise of structural power by a leader who was able to organize this event and strategically promote its interpretation in his own interest.

In sum, leadership in Southeastern societies was integrally linked with ritual expression and sacred space. Sacred places provided avenues for leaders to gain prestige and status through coordinating the construction and maintenance of those places, by inscribing their households and ancestors onto those places, and by sponsoring and performing rituals and ceremonies. Next I turn from particular sites to interpretations of site distribution across the landscape.

Settlement Patterns

Mounds sites have been widely used in studies of settlement patterns in order to determine polity size and levels of hierarchical control, starting with Steponaitis (1978) work in the Black Warrior River Valley and Smith's (1978) edited volume of regional studies. Steponaitis (1978) examined the size of mound sites and proposed that different sites represented hierarchical centers, or nodes, within a chiefdom. He explained the position of these sites in terms of political economy and maize production. He examined the relative productivity of the land around each site and the distance of the smaller sites to the larger sites, proposing that the delivery of tribute affected site positioning.

Hally (1993) used mound sites in northwestern Georgia to examine the size of chiefly polities. He measured the distance between all contemporary mound sites and then plotted the distribution of all inter-site distances. He found a bimodal distribution: most mound sites were either less than 18 km or more than 30 km apart. This implied that polity sizes were no more than 40 km wide. If the chief lived at the center of such a polity, this represented the distance that a chief could travel to his outermost holding and return in one day, keeping a direct eye on his constituents and yet sleeping safely at home at night. Muller (1997) found that this distribution also held true for the Lower Ohio Valley. Hally's model is based on two assumptions: first, that the mound sites are contemporaneous, and second, that the mound sites do indeed represent political centers.

These studies classified all of the sites within a region by size, and measured the degree of complexity by the number of size grades within the region. It was assumed that larger sites exercised control over smaller sites in these studies of sociopolitical integration. This may or may not have always been the case. As noted by Cobb (2003), mound sites (or, for that matter, large villages) are insufficient for studying sociopolitical integration. We also have to know how smaller sites were distributed across the landscape and how those sites related to one another.

The chronological relationship between sites has not always been clear and has the potential to complicate interpretations of settlement patterns. Clay (2006) noted that sometimes we may be looking at complex historical trajectories rather than complex sociopolitical structures. The mid-1990s saw a flurry of Mississippian studies addressing chronological shifts between mound sites. Anderson (1994, 1996) proposed that factional competition could explain why some mound sites were located so near to one another. He also saw evidence for chiefly cycling between simple and complex forms. Hally (1996) believed that southeastern chiefdoms were inherently unstable and noted that few platform mounds were in use beyond 100 years. He interpreted cessation of mound construction at a site as the fall of a chiefdom. Blitz (1999) found that cycling and factional competition could not explain the distribution of mound sites in southern Appalachia. Instead, he proposed that a fission-fusion process was at work, whereby different communities drew together or dispersed based on the level of stress upon them. He suggested that a landscape with widely-dispersed mound sites might represent political decentralization, rather than the extension of chiefly control and social integration.

Settlement patterns and geographic constraints have also been used to help explain leadership strategies. Beck (2003, 2006) proposed different strategies for instigating sociopolitical integration, in which leaders acted differently while consolidating and legitimizing power. He proposed that when the population could easily move around the landscape, “voting with their feet”, leaders had to use persuasion to attract followers. On the other hand, when movement was restricted, leaders could act coercively to expand their influence. The first situation would lead to a polity where power was dispersed more broadly, which Beck termed a constituent hierarchy, whereas the second situation would lead to a concentration of power in an apical hierarchy. Further, Beck (drawing on Renfrew 1974 and Blanton et al. 1996) suggested that leaders would initially use group building strategies, such as mound construction, to attract followers. Later, they would use group-distancing strategies to legitimize the elite position of themselves and their kin groups. This might involve making mounds more exclusive and the creation of symbolic elite regalia. Payne (2006) also drew on Blanton et al. (1996) to suggest that the Upper Nodena polity was characterized by a corporate form of organization, whereas the Lake Jackson polity was characterized by a network form of organization. In the first case the leaders legitimized their elite status by drawing on the strength of their local kin networks, whereas in the second case the leaders drew on cosmological forces and long-distance connections. King (2003, 2004) used corporate and network strategies as well, to explain certain episodes in the occupational history of Etowah.

In the past fifteen years more studies have been published that focus on smaller sites and on lateral and heterarchical relationships among social groups, rather than simply on hierarchical relationships between leaders and followers. These studies have also demonstrated that a great deal of variation exists between small-scale sites, suggesting that they cannot be used as interchangeable nodes in site-size hierarchy studies (Cobb 2003). Maxham (2000) examined several sites in the Black Warrior Valley and found significant variation between them, especially in terms of their ceramic assemblages. She suggested that one of the sites represented a place where community members came to gather for celebrations not under the direct control of a member of the chiefly hierarchy. This place could have been the home of a prominent sodality or clan member. She stressed the need to consider lateral relationships among so-called commoners when modeling Mississippian social organization.

Welch (2006) also looked at small sites, addressing the issue of “anomalous rural settlements” in the American Bottom. These sites were characterized by apparently anomalous artifact assemblages or site structures. He challenged the view that these sites represented some form of node in a hierarchical chain of leadership. Instead he proposed a series of alternative explanations for variation among small settlements. First he turned to ethnohistoric information on the Dhegiha Sioux. Traditionally Mississippian archaeologists used Muskogean speakers for ethnographic analogies, but it has become apparent that Siouan speakers were connected to Mississippian developments in the American Bottom (Hall 1991; Kelly 1996). He noted that the Dhegiha Sioux sodalities had held house-based rituals and compared the structure of these rituals to what might be left in the archaeological record. This might be one explanation for differences among small settlements. Other differences might result from houses or settlements occupied by families at different stages of their life histories or from the presence of council members or ritual specialists in a household. Both Maxham’s and Welch’s studies are excellent examples of how the thinking through the complexities of both ranked and unranked social relationships can enrich our interpretations of the archaeological record.

Sociopolitical Organization in the Caddo Area

Models used to interpret the sociopolitical organization of the Caddo area have drawn heavily from southeastern models of hierarchical organization and from ethnohistoric records. These models are a very good starting point and work well for certain times and places. We should be able to develop better and more specific models, however, by drawing on the aforementioned debates about the integrative versus exclusionary nature of mound sites, the use of ideology by political leaders, shifting use of mound sites over time, and diversity among community settlements. Recent literature on social memory and animism will also inform my interpretations of ritual and political practices among the Mountain Fork Caddo. Before getting into the evidence specific to the Mountain Fork, I will discuss current interpretations of Caddo sociopolitical organization.

Ethnohistoric Models

The major ethnohistoric model of sociopolitical organization for this area was developed by Wyckoff and Baugh (1980) based on historic records on the Hasinai Caddo of East Texas compiled by Swanton (1942) and Bolton (1987) from primary sources. The Hasinai were one of three Caddo confederacies that developed during the early historic period, possibly because of population decline following the onset of diseases introduced by Europeans (Perttula 1992:73-78). The other two confederacies were the Kadohadacho, who lived along the Great Bend of the Red River, and the Natchitoches, who lived along the lower Red River in Louisiana.

Wyckoff and Baugh (1980) recognized that the primary documents were biased towards descriptions of political leaders, because the European conquistadors and traders needed to identify leaders with whom they could negotiate. This bias, however, converged with the authors' interest in identifying material correlates of elite positions that might assist in the interpretation of the archaeological record. The Spanish records also focused heavily on the settlement structure of the Hasinai and later the Kadohadacho, because the missionaries wanted the people to congregate into more concentrated settlements around missions.

Using documents dating from A.D. 1680 to 1725, Wyckoff and Baugh (1980) identified a series of elite positions within Hasinai society, including both religious and political leaders. The three main positions were those of the *xinesi*, the *caddis*, and the *canehas*. The *xinesi* was the religious specialist for a series of communities. He maintained a temple containing a perpetual sacred fire, mediated between the deities and the people, lead certain rituals, and had the right to assemble the communities' leaders (Wyckoff and Baugh 1980:10). Each community was lead by a *caddi*, a political leader responsible for dealing with foreigners and trade, leading the community council, setting dates for house construction, settling inter-community disputes, and sponsoring numerous ceremonies throughout the year (Wyckoff and Baugh 1980:234-235). In all of this, the *caddi* was assisted and guided by the *canahas*, or community elders, who may have been representatives from small sets of households.

Based on European observations as to the respect accorded to persons in these three positions (including observations on who was seated first and who could order the others), they were likely hierarchically ordered from *xinesi* to *caddi* to *canahas* (Wyckoff and Baugh 1980:238). Heterarchical differentiation may also have existed between the *xinesi* and *caddis*, though, given their different realms of responsibility in the religious and political arenas.

Other potentially elite positions included *tanmas*, who assisted the *caddis*, *chayas*, pages who assisted the *canahas*, *conna*, who were religious specialists of a lower order than the *xinesi* who practiced healing, divination, and astrology, and *amayxoya*, who were war leaders (Wyckoff and Baugh 1980:237). The *tanmas* and *chayas* also suggest a high level of administrative apparatus, if not administrative specialization, among the Hasinai. Their roles were abundant and included organizing house construction, punishing those who slacked during communal construction activities, and collecting ceremonial tobacco for the *caddi*.

Although a hierarchical chain of command was certainly present in historic Hasinai society, Saitta's (1997) Marxist model is potentially more useful for understanding Hasinai sociopolitical organization than neo-evolutionary models of chiefly authority. The neo-evolutionary models tend to focus solely on hierarchical chains of command lead by authoritative figures in order to describe sociopolitical organization. Saitta (1997) suggested that some societies treated their political leaders and ritual specialists as a "communal subsumed class" that earned the right to special entitlements through their maintenance of the social means of production, which included maintaining good relations with the cosmological realm.

The Hasinai leaders engaged in numerous activities that served the community. Some of these activities were more important materially and some ideologically, although it would be a mistake to assume that these realms were completely separated in the minds of the Hasinai. Material and ideological concerns were integrally connected, particularly in terms of ensuring the success of subsistence activities through facilitating the proper practices and rituals. Although political and religious leadership was organized hierarchically, leaders not only worked on behalf of the community but also organized communally-oriented activities house construction. The direct involvement of both political and religious leaders in coordinating activities meant to benefit the whole community, for minimal benefits other than prestige and sometimes food, suggests that these leaders were involved in more socially integrative rather than exclusionary practices. During the early historic period, Hasinai leaders received certain material and social benefits from the community in exchange for facilitating proper relationships with the spiritual world, managing external relations, and assisting with local communally-oriented activities.

Members of the political-religious Hasinai leadership were apparently almost always men. Among the Hasinai and the Kadohadacho, however, women were almost entirely responsible for agricultural subsistence activities. The Caddo were socially organized into matrilineages whose women played a vital role in their families' success. Sabo (1998:161-163) discussed how these gender divisions were expressed mythologically in an important Caddo story, in which a young man was enabled to kill a monster because of material support from his female relatives, highlighting the structural aspects of this idiom. As Barr (2007:60-62) points out, Hasinai men recognized the importance of women in maintaining economic stability. This was clearly seen in the Hasinai's concern about the Spanish missionaries, who could neither provide for themselves nor engage properly with the community because no women accompanied them. Behind every successful Hasinai man and political or religious leader was a strong family of women who provided for them economically.

Although the historic Caddo were organized matrilineally, positions of leadership were apparently inherited patrilineally, which puzzled anthropologists for some time. Knight (1990) addressed this social practice by drawing on ethnohistoric records from the Southeast, looking mainly at the Chickasaw, Hasinai, Timucua, Apalachee, and Natchez. He identified three major characteristics regarding social organization in most of these societies, including non-territorial exogamous ranked clans, local corporate lineages, and an overall dual organization. Within those systems membership in these different social groups was primarily determined by filiation rather than by descent. In a local matrilineage, for example, sons belonged to the matrilineage, but sons' children did not. Knight (1990) proposed that high-ranking male leaders used agnatic descent in order to keep their male children from reverting to their mothers' lower-ranking status, because any marriage made by a man from a high-ranking clan or matrilineage would have to be exogamous, that is, he would have to have married a lower-ranked woman. Among the particularly hierarchical Timucuan society there were even specific names for families derived from former chiefs and for male descent lines, illustrating how high-ranking lineages manipulated kinship rules in order to transmit their social positions.

The conscious manipulation of kinship in order to claim particular relationships and attendant privileges is similarly practiced by Levi-Strauss' (1979:47) social houses, which were corporate groups that used the language of kinship flexibly in order to perpetuate ownership of material and non-material property. It is potentially helpful to conceptualize the high-ranking Hasinai matrilineages as social houses that maintained ownership of both immaterial property (probably ritual knowledge as well as male leadership positions) and possibly material property (in the form of fields tended by the women) through creative management of kinship relations.

Settlement Patterns and Mound Sites in the Caddo Area

Because of the ethnohistoric evidence for hereditary centralized, hierarchical leadership positions, it is widely held that the historic Caddo societies were organized as chiefdoms (Perttula 1992; Wyckoff and Fisher 1985). We cannot assume that the ancestral Caddo were necessarily always organized in this manner, however. Although archaeological evidence for hierarchical organization exists in some times and places, evidence in other places is scanty or has yet to be assessed. Thirty years ago archaeological studies in the Caddo area tended to focus on assessments of regional hierarchies, engaging with the contemporary interest in applying neoevolutionary models to the archaeological record (Brown et al. 1978; Early 1982). These studies provided a valuable overview of regional settlement patterns. More recently researchers have taken advantage of better chronological data and more fine-grained analyses to examine the history of particular places, providing a more nuanced view of the sociopolitical dynamics in particular localities (Brown 1996; Cranford 2007). Analyses of mounds and mound sites have also advanced with the use of geophysical techniques (Hammerstedt et al. 2010; Lockhart 2010; Maki and Fields 2010; McKinnon 2010; Perttula 2010; Samuelson 2010; Walker and Perttula 2010), which are uncovering new data on intra-site settlement patterns. This project intersects with the interest in examining detailed histories of particular places in an attempt to assess the sociopolitical dynamics of the Mountain Fork.

The primary model of settlement structure within the Caddo area was developed by Schambach (1982) based on the Teran Map of 1691-1692, which showed farmsteads and a single mound dispersed along at least 4 km near the Great Bend of the Red River (Figure 2.1). These farmsteads each contained houses and sometimes ramadas (drying racks) and granaries, all surrounded by brush fences. In the middle of the community a *caddi* dwelled and at the far western end of the community a platform temple mound was present. The location of the temple mound at the edge of the community may signal its liminal status, since this was where the *xinesi* communicated with the spiritual realm. Sabo (1998:169-170) suggests another possibility, that it was placed at the edge of one community because the *xinesi* served multiple surrounding communities. The "Great Chenesi" of the Hasinai, for example, was the highest ranking spiritual leader for nine tribes encompassing 35 Spanish leagues (about 70 miles) in east Texas (Bolton 1987:34, from Casañas 1691:fols. 7-8).

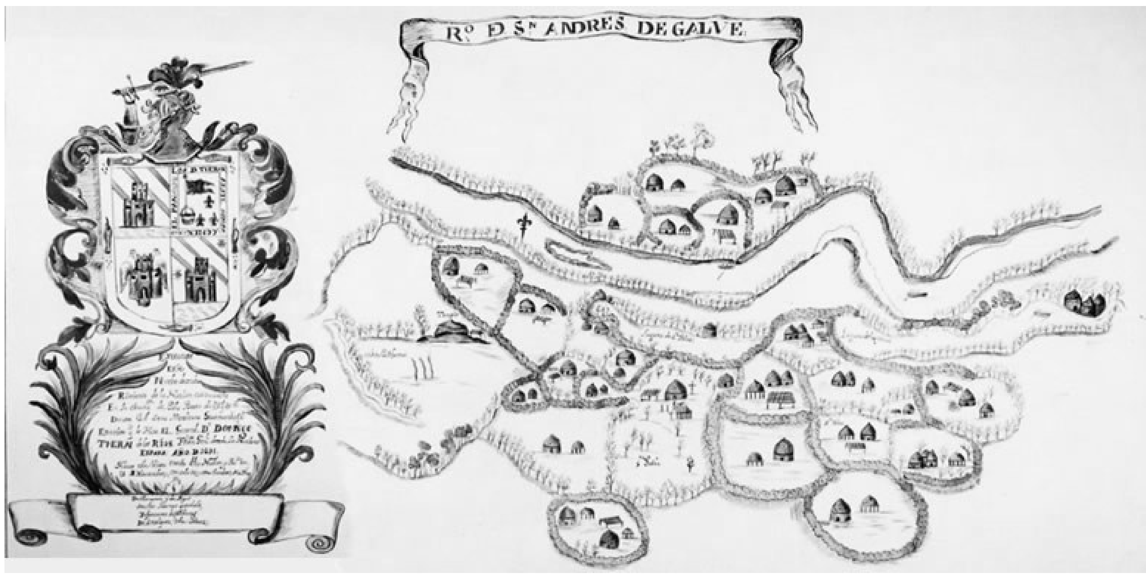


Figure 2.1.Teran Map of Upper Nasoni settlement along the Great Bend of the Red River (from Texas Beyond History).

Excavation of the Hatchell-Mitchell-Moore complex along the Red River has confirmed that these sites encompass the locality illustrated in the Teran Map, confirming its accuracy in many regards (Perttula 2005:181). As noted by Perttula (2005:181), when Teran visited this Upper Nasoni community 36 residences were present and the residence of the *caddi* was situated near the center. When Schambach originally developed this model of Caddo settlement he also took into account photographs taken by Soule between 1868 and 1872 of Caddo refugees in Oklahoma who built houses similar to those on the Teran Map. Based on this, Schambach and his colleagues (1982) named this the Teran-Soule model of Caddo settlement.

Although this pattern of dispersed households extended across much of the Caddo archaeological area, in places more aggregated settlements existed. At the Oak Hill Village site (41RK214) in the Sabine River basin of Texas, for example, a series of 11 structures or clusters of overlapping structures were grouped around a single small mound and plaza from around A.D. 1250-1350/75 (Perttula and Rogers 2007). Uncertainty exists over the degree of occupation at sites with mounds, which apparently varied across the Caddo area (McKinnon 2008; Perttula 2008; Wyckoff 1967a; Wyckoff and Fisher 1985). More excavation took place at Oak Hill Village than is usually possible at an archaeological site. It is possible that other sites with one or more mounds may contain more concentrated settlements than have previously been recorded. McKinnon (2008), for example, recently used geophysical survey methods to demonstrate that the Battle Mound site, which contains the largest mound in the southern Caddo area, was not the “empty mound center” that it once appeared to be. Instead, a number of structures, features, and probable burials surround the mound, although the temporal relationship between these structures and the construction of the mound is as of yet unknown, highlighting the need for future ground-truthing.

The relation of dispersion versus aggregation of households and settlements to sociopolitical organization is complex. A site such as Oak Hill Village may represent the presence of a persuasive charismatic leader who drew people to this locality through integrative activities such as mound-building, creating an emergent or presumptive chiefdom (Beck 2003; Milner and Schroeder 1999). If we shift scales, however, and switch from household to community as the scale of analysis, a pattern of dispersal rather than aggregation appears in this region. Perttula and Rogers (2007:89-91) note that this period saw an increase in the number of independent communities across northeastern Texas. This settlement pattern contrasts to the that in the prior period, before A.D. 1250, in which more people were living at the region's two largest sites (George C. Davis and Hudnall-Pirtle) and fewer communities were dispersed across the landscape (Story 2000:23). If this was the case, then the Oak Hill Village site may represent the decentralization of authority on a regional level, although the authority of individual *caddis* may have been on the rise. This example demonstrates the need for archaeologists to (1) consider a number of different scales when examining the relationship between settlement patterns and sociopolitical organization (as suggested by Rogers 1995) and (2) focus on the history of particular regions and sub-regions.

The interpretation of mounded landscapes in the Caddo area is complicated by the different types of mounds present. In the Arkansas Valley, at least four classes of mounds existed, including accretional burial mounds (often with associated mortuary facilities), small buried structure mounds, platform mounds, and multi-lobed substructural mounds (Bell 1972; Brown 1996; Brown et al. 1978). Brown and his colleagues (1978) developed a site-hierarchy model for this region that ranked sites based on the number of different types of mounds at a site, interpreting sites with the greatest variety as the most specialized and highest-ranking civic-ceremonial centers.

Brown and his fellow researchers (1978) found that most of the Arkansas Valley mound centers were evenly spaced across the landscape, "no closer than 15 km and no further than 30 km to their nearest neighbor" (Brown et al. 1978:192). The two exceptions are the nearby Norman and Harlan sites, which Cranford (2007) interpreted as representative of competition between communities. This evenly spaced distribution is different from Hally's (1993) bimodal distribution of nearest neighbor mound sites in northwestern Georgia. Although Brown and his colleagues interpreted most of these sites as a series of hierarchically-oriented centers, their even spacing across the landscape may instead indicate that they were all relatively undifferentiated local centers serving their surrounding populations. Robert Brooks (personal communication 2009) has suggested that the major differences between these sites may be largely because they were utilized for different lengths of time. Spiro may be the major exception, as its site history was quite different from any other site in the area, so far as we know at this time.

Early (1982) drew on Brown and his colleagues' (1978) model to describe the types of sites in the Ouachita River basin of southwestern Arkansas. Alongside small non-mound settlements, Early identified two types of mound sites: low mound clusters and mound centers. Low mound clusters contained small buried structure mounds, which also occasionally contained burials. These sites also sometimes included middens, cemeteries, and non-mounded structures. Early defined mound centers by the presence of platform mounds in addition to the smaller buried structure mounds and other features.

Several important differences exist in mound site structure and distribution between the Arkansas Valley and the Ouachita Mountains. While mound sites in the northern area were usually at least 15 km apart, relatively contemporaneous mound sites in the Ouachita River basin were clustered more closely, with some mound sites as little as 4 km apart. This distribution indicates likely differences in sociopolitical organization and perhaps mound use and significance between this region and the Arkansas Valley. The nearby mound sites could be interpreted as differential nodes within a site hierarchy, indicating regional hierarchical integration. It is also possible, however, that no regional centralization of authority existed and that the mound sites each served a local population, or that the mound sites served different heterarchical functions within the regional site network.

Mound sites in the western Ouachita Mountains are arranged in several different configurations. The Grobin Davis site (34MC253; Wyckoff and Fisher 1985) is the largest mound site in this region, containing seven mounds arranged along the edge of a terrace. The mounds include two platform mounds, the largest a two-stage platform mound that is 2.1 meters tall (Amanda Regnier, personal communication 2012). Most of the other mounds are considerably smaller and roughly circular. Geophysical survey by Hammersedt and Regnier at the Oklahoma Archeological Survey is currently underway to learn more about this site. In contrast, the Pine Creek Mound Group (34Mc146; Gettys 1975) and Bohannon (34Mc127) only have one to three mounds each, which are all small buried structure mounds. The chronological relationship between these sites is uncertain.

The Clement site (34MC8) locality along the Glover River, also in the western Ouachitas, is somewhat different (Hammerstedt et al. 2010). It is only six kilometers from Grobin Davis. The Clement site itself originally contained three mounds with an additional mound at the nearby A.W. Davis site (34MC6; Wilson 1962), and others have been reported in the vicinity. These mounds were probably not situated around a plaza. They include one platform that was 2.4 m tall, akin in size to the platform at Grobin Davis. Later in this site's history a shaft tomb was inserted into the mound for a richly outfitted multiple-interment burial. This site was likely occupied over a lengthy period between A.D. 1200 to 1500, although occupation was probably not continuous directly at Clement (Patrick Livingood, personal communication 2012).

Buried structure mounds play a prominent role in this project. They are present at two sites along the Mountain Fork: Woods Mound Group (34Mc104) and Biggham Creek (34Mc105). Buried structure mounds occur across the Caddo area, from the Harroun site in Texas to sites throughout the Ouachita Mountains up to Arkansas Valley. Five defining attributes have been identified for these mounds and their accompanying buried structures (Trubitt 2009). Most significantly, the mounds represent a ritual cycle that included the construction of a building, its destruction through dismantling or burning, and then covering the building with earth. Other attributes include a high incidence of extended entranceways, sometimes earthen berms surrounding the structure, and sometimes blocked entrances. Finally, the buried structures tend to be larger than other structures at a given site.

Based on the relatively high co-occurrence of these attributes, and the ubiquity of buried structure mounds themselves across the Caddo area, it is clear that the Caddo had certain general shared ideas about the significance and treatment of certain types of buildings (Early 2000). Among different sites, however, the size, configuration, and contextual associations of buried structure mounds vary (Brown 1996:169-170). Accordingly, various interpretations of their function have been suggested, including mortuary facility, council house, temple, or elite residence (Rogers 1982:89-90; Wyckoff and Baugh 1980).

For the Arkansas Valley, Brown (1996:170-172) suggests that two main types of buried structure mounds existed, those covering charnel houses and those covering elite residences. Buildings interpreted as elite residences had simple entrances and abundant living refuse. Some elite residences, those that housed political leaders such as *caddis*, may have served communal functions during the life of the building, although they were symbolically set apart from other buildings through their later burial. Ethnohistoric accounts indicate that the residences of political leaders served as focal points for a community's external affairs, a prime responsibility of those leaders (Swanton 1996:184; Wyckoff and Baugh 1981). Visitors, at least European visitors, were sometimes housed in the leader's residence. Joutel also noted victory ceremonies conducted within a leader's residence after a successful military excursion (Swanton 1996:186-187).

Some of the buildings at Spiro interpreted as elite residences were constructed quite early, during the Evans and Harlan phases (A.D. 1000-1250) (Brown 1996:115-122, 171-172; Rogers 1982). Large platform mounds, at least those topped by structures rather than fire pits, do not appear in the Caddo area until after A.D. 1200 (Brown 1996:169). Even then they do not occur uniformly. It may be that in some times and places, buried structure mounds over apparently residential buildings may indicate a form of political organization in which a political leader was *not* physically segregated from the rest of the population during his life, at least not to the degree found in communities with platform mounds. At a certain point, however, perhaps upon the death of the leader, his house was covered. The house was treated as a person, and ritually buried. This could have been a mark of respect for the leader and his kin-group or it could have been a kin group's means of signaling its own prominence. It might also have been seen as an appropriate way to treat a building or the physical representation of a social house that was important to the community during its life. Alongside either of these explanations, burying a house also imparted ritual significance on a particular place, imbuing certain parts of the landscape with particular meanings.

Unlike proposed elite residences, buried buildings interpreted as charnel houses usually had blocked entranceways or extended entranceways, evidence of human remains, and little other debris (Brown 1996:170-172). Some buildings appeared to have combinations of features associated with elite residences and charnel houses, but Rogers (1982:90) suggests these functions were not necessarily exclusive and some charnel houses may also have been residences of ritual leaders. Kay and Sabo (2006) provide further insight on Arkansas Valley charnel houses, linking their southwesterly orientation to symbolic associations with death, winter, and the journey of the souls. They also identify fire with death (and, in paired opposition, with life and renewal). They suggest that burned structures, whether buried or not, were associated with death, including the historical war houses where men retreated before a raid (Swanton 1996:184-192). Burning a building sends smoke into the air, and historically smoke has been (and continues to be) particularly significant to the Caddo as a means of spiritual communication (Schambach 1996). In sum, burning and burying a structure, although they did not always occur together, were both significant rituals with great time-depth in the Caddo area, although the activities that took place in these buildings and their relationship to sociopolitical structure were variable.

Summary

In this chapter I discussed models of sociopolitical organization for middle-range societies, especially for those most often classified as chiefdoms. Several themes emerged that will be pertinent for interpreting the archaeology of the Mountain Fork Caddo. First, interpretations of middle-range societies have become richer in recent decades. Instead of focusing exclusively on stages of complexity or on identifying hierarchical leadership, newer studies have looked at both sociopolitical processes and historically contingent circumstances in order to explain variability in the archaeological record. Second, small sites have become more interesting to archaeologists who are trying to identify the multitude of social relationships, ranked and unranked, within middle-range societies. Third, ideology has become a more common topic for archaeologists to address in their work, particularly for those interested in how leaders manipulated ritual knowledge and practices for their own benefit. Finally, the importance of conducting fine-grained analyses in particular places has become apparent in the Caddo area and elsewhere in order to develop nuanced local histories that will help us to identify and explain variation in sociopolitical dynamics. That is the major goal for my project.

The next chapter will describe the archaeology of the Mountain Fork, looking at the physiographic setting, history of archaeological work, and site descriptions. I will also discuss an ethnobotanical analysis recently conducted on material from the northernmost-known site in the valley in order to identify subsistence practices. This will set the stage for the major component of this project, a pottery analysis of approximately 12,000 sherds and vessels from this valley conducted to study the local chronology, social integration and affiliations, and potential variation between the two mound sites.

Chapter 3: Mountain Fork Archaeology

The Mountain Fork River valley, the focal region of this study (Figure 3.1), is located within the Caddo archaeological area (Perttula 1992), which encompasses the traditional territories of the ancestral Caddo in the biogeographical area known as the Trans-Mississippi South (Schambach 1998). The Mountain Fork is one of a series of streams that flow south out of the Ouachita Mountains, joining with the Little River, which runs into the Red River and eventually to the Mississippi. In 1966 the Mountain Fork was impounded to make the Broken Bow Reservoir, which now covers 1,952 square kilometers (Matthews et al. 2005:308). Most of the archaeological sites in this study are under the reservoir. Before reservoir construction, the valley ranged from one-half to three-quarters of a mile wide for about seven miles north of the dam (Wyckoff 1961). Above that, it shrank to about one-eighth to one-quarter of a mile wide, before opening up again at the northern boundaries of the present study area. The density of Caddo sites within the reservoir area may be related to the terraces and bottomlands present here, in contrast to the steep slopes and bluffs that flanked the river just north and south of the reservoir (Wyckoff 1967a:2).

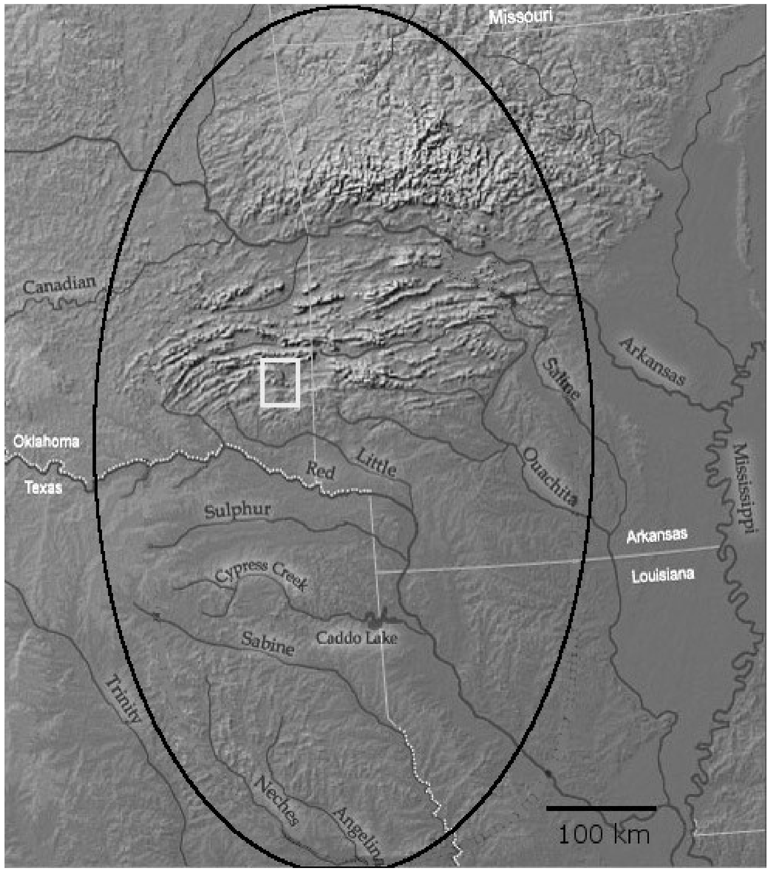


Figure 3.1. Maximum approximate extent of the Caddo archeological area (black circle). Study area marked with a white box. (Adapted from Texas Beyond History: The Caddo Homeland).

Geology and Lithic Resources

The Ouachita Mountains are composed of fold-and-thrust belts, or mountain ranges that resulted from the collision of the earth's plates (Suneson 1995:2). The mountain ridges run east to west through most of the range from Little Rock, Arkansas, into Oklahoma and then turn southwesterly around Talahina, Oklahoma. The Ouachitas are part of a long chain of mountains extending from the Appalachians of the eastern U.S. to the Marathon Mountains of west Texas and northern Mexico (Johnson 1998:3).

We only see the exposed part of these ranges; most of the ancient ranges are covered by younger rocks and sediments.

The Ouachitas are divided into three different zones or belts, defined by the structure and age of the rock formations (Suneson 1995:2-4). The upper Mountain Fork runs first through the central belt and through the Broken Bow uplift. The central belt tends to have slightly wider valleys because the thrust faults that created the mountain ridges are more widely spaced. The rocks of the central belt are mainly sandstone and shale that formed from sediment deposits around 350-310 million years ago during the late Mississippian and early Pennsylvanian geological eras. The folds of the Broken Bow uplift are more closely spaced with narrower valleys and include some of the oldest rocks in the mountains (Suneson 1995:4). The Broken Bow uplift rocks are mainly shale and cherts that formed from sediments deposited under the deep ocean Ouachita Basin 500 to 350 million years ago (Suneson 1995:7).

After the folding, faulting, and uplift episodes created the mountains of the Ouachitas, weathering occurred, leaving ridges of resistant rocks including sandstone, chert, and novaculite and creating valleys of eroded shale (Johnson 1998:3). South of the Broken Bow Uplift is a region 8 to 18 miles wide characterized by similar folding of the underlying formations, but the relief is much lower, with hills present instead of mountains (Thornbury 1965:284). South of this begins the Gulf Coastal Plain, which is covered with sedimentary rocks formed from sediment deposits on the edges of a Cretaceous era sea after about 125 million years ago (Suneson 1995:13).

In the central belt, the Mountain Fork and one of its tributaries, Big Eagle Creek, run through the Jackfork sandstone formation (Banks 1990:Figure 1:20). This formation contains large amounts of a quartzitic sandstone that was used widely for tool-making at Ramos Creek (Banks 1990:41-43). In the Broken Bow Uplift the Mountain Fork runs through a series of chert-bearing formations, including outcrops of Novaculite and Bigfork chert (Banks 1990:Figure 1.20). These outcrops begin to appear at the northernmost extent of the uplift, just south of Ramos Creek, and continue to appear through the southern end of the present-day Broken Bow Reservoir (Figure 3.2).

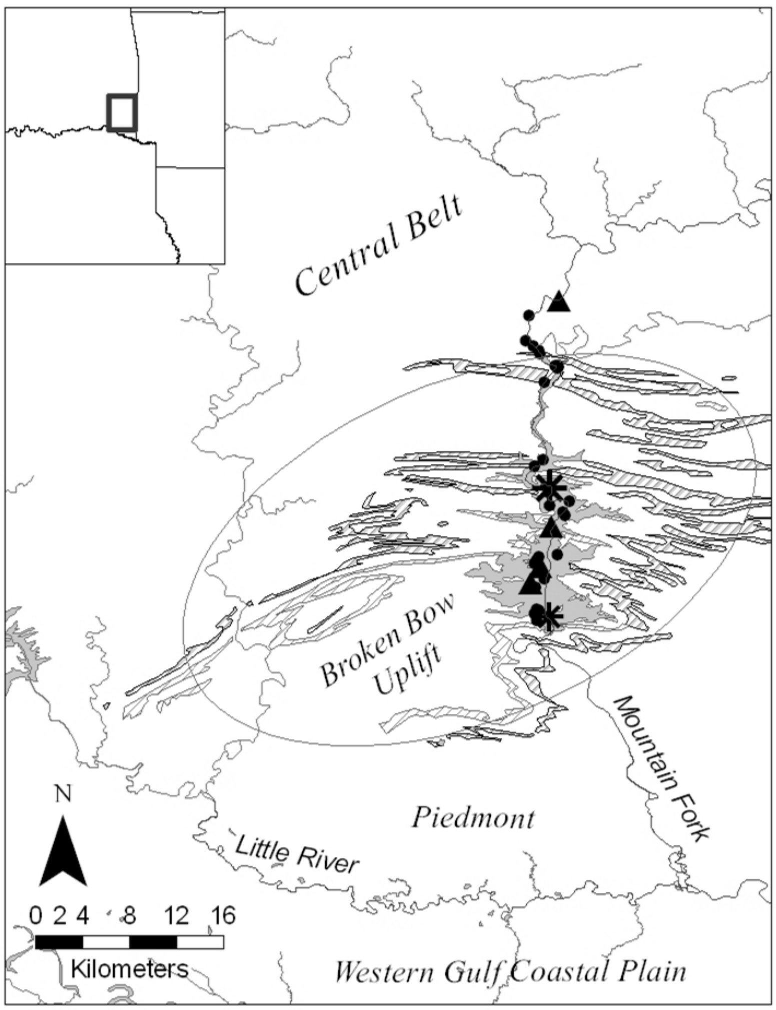


Figure 3.2. Outline of Ouachita Mountains geology near the study sites. Novaculite outcrops marked with dark hatching; Big Fork chert outcrops marked with light hatching.

The convergence of the Mountain Fork with the Broken Bow Uplift was advantageous for people seeking access to high-quality lithic resources. Because of their similar geologic age, outcrops of Bigfork chert and Novaculite occur near one another in the Broken Bow Uplift, and in formations of corresponding age including the Potato Hills in Oklahoma and the Benton Uplift in Arkansas (Suneson 1995). Together all these zones are also known as the Novaculite Uplift (Thornbury 1965:284). Bigfork chert was first described by Purdue (1909) based on his observations of outcrops in Polk County, Arkansas and was subsequently commented on by Honess (1923), Hendricks and colleagues (1947), Miller (1955), Pitt and colleagues (1982), and Banks (1990). This relatively brittle cryptocrystalline chert is usually opaque with a dull to slightly vitreous luster. Bigfork tends to be black, although some dark gray and brown varieties have been recorded (Banks 1990:33-35). Different colored bands are sometimes present.

Novaculite from the Ouachita Mountains is known as Arkansas Novaculite (Banks 1990:36-40). It is a fine-grained silica-rich material similar to chert, but containing more microcrystalline quartz than fibrous cryptocrystalline quartz (Bates and Jackson 1980:1-3). Keller and colleagues (1977, 1984) have proposed that novaculite underwent thermal metamorphosis, which may account for its very hard consistency. It varies in color from white to black to greenish-blue (in the Potato Hills area) and is often translucent. Trubitt (2005, 2007) has conducted extensive work documenting novaculite quarrying and use in the archaeological record.

All of the sites in the study area are in the Ouachita biotic district (Blair and Hubbell 1938). The climate is continental, with hot usually humid summers and cool humid winters (Johnson 2008:18). It is influenced both by westerly airflow from the Pacific and by warm, moist air from the Gulf Coast (Borchert 1950). The recent mean annual temperature (1971-2000) varied from 58 to 62 degrees Fahrenheit, with cooler temperatures occurring at higher elevations (Johnson 2008:18). The mean winter temperature varied from 40 to 44 degrees and the mean summer temperature from 76 to 80 degrees Fahrenheit. Average annual precipitation (1971-2000) was about 52 inches, with most of the precipitation occurring in the spring and fall.

The majority of the vegetation in the study area is dominated by oak-pine and oak-hickory forests and by riparian bottomlands (Duck and Fletcher 1943; Hoagland 2008:17). The oak-hickory forests occur in the southern and lower parts of the mountains. They are populated by a variety of oaks, including black, blackjack, post, northern red, southern red, and white oak, along with shagbark, black, pignut, mockernut, and bitternut hickory. Other woody plants include flowering dogwood, highbush and lowbush blueberries, hophorn beam, redbud, serviceberry, and sugar maple. Flowering herbaceous plants include Dutchman's breeches, Solomon's seal, troutlilies, Virginia waterleaf, wake robin, and wild ginger.

Oak-Pine forests naturally cover the northern part of the mountains and higher elevations (Duck and Fletcher 1943; Hoagland 2008:17). These are similar to the oak-hickory forests, but are dominated by shortleaf pine. Woody plants in the riparian bottomlands includebald cypress, American snowbell, buttonbush, hazel alder, water elm, water hickory, and overcup and water oaks. Wetland plants include duckweeds, spongeweed, pennywort, water crowfoot, and pondweed. In the 1900s major pine plantations started using the Ouachita Mountains extensively, and today little of the old-growth forest exists except at the McCurtain County Wilderness Area.

Albert and Wyckoff (1984) and Pitt and colleagues (1963) have thoroughly described the mammals, birds, insects, reptiles, and fish present in the Ouachita Mountains.

Soil development is affected by climatic factors, vegetation, and the mineral and textural characteristics of the underlying formations. In the Ouachita Mountains most of the soils developed from sandstones and shales under the oak-hickory-pine forests (Carter and Gregory 1996). They tend to be light colored and acidic, with sandy-loamy A horizons over clayey subsoils. Two major groupings of soil series are present. Most of the study area, including the land around today's Broken Bow Reservoir, has soils from the Carnasaw, Clebit, and Pirum series. These are ultisols and inceptisols that are loamy, well-drained, and moderately acidic soils on steep slopes. North of the reservoir (and probably along some of the banks of the Mountain Fork before the reservoir was constructed) has soils from the Tuskahoma, Wetsaw, Muskogee, Neff, Sherwood, and Wister series. These are alfisols and ultisols that are loamy, silty, and clayey and moderately well-drained. They are very acidic and occur on moderately steep slopes. Few of these soils are ideal for agriculture, but small pockets of farmable land do exist along the Mountain Fork.

Caddo Sites along the Mountain Fork

Intensive archaeological research along the Mountain Fork began in 1961 when Don Wyckoff conducted a survey of the land that would be inundated by the Broken Bow Reservoir. He identified 57 archaeological sites, including 21 with pottery diagnostic of Caddo occupations (34Mc1, 34Mc21, 34Mc25, 34Mc47-48, 34Mc50-58, 34Mc62-63, 34Mc66-67, 34Mc72, and 34Mc75). With funding from the National Park Service, the Oklahoma River Basin Survey Project was able to conduct salvage excavations from 1964-1966 at seven sites, including five identified in the 1961 survey and two more that were identified later. While in the planning stage for these excavations, Dr. Robert Bell accompanied Don Wyckoff to look at the sites in the Broken Bow Reservoir area and also in the Pine Creek Reservoir area, which was also targeted for salvage excavations. Dr. Bell urged Wyckoff to pick sites with the deepest middens, because at the time they had no sense for the time depth of occupation in this region. Looking back, Wyckoff (personal communication 2012) views this as a mistake and thinks that excavating some of the single component sites he identified could have been more informative. For example, he originally recommended excavations at 34Mc63, a large site just south of Woods Mound Group with a material assemblage consistent with an early Caddo occupation (Wyckoff 1961:25). The sites with Caddo components finally chosen for excavation, however, included Beaver (34Mc1, Wyckoff 1968), Hughes (34Mc21, Wyckoff 1966), E. Johnson (34Mc54, Wyckoff 1967b), Woods Mound Group (34Mc104, Wyckoff 1967c), and Biggham Creek (34Mc105, Wyckoff 1965).

After the 1960s, not much archaeological work was conducted near the Mountain Fork until Klinger and Cande's (1987) survey of selected shoreline areas along the reservoir being affected by erosion. They located 27 new sites, including four with Caddo components. They made several pertinent observations about site distribution, noting that sites were almost always near permanent water sources, no sites were present on upland landforms, and buried archaeological deposits were present at the upper (northern) end of the reservoir area (Klinger and Cande 1987:55).

Additional survey was conducted by Perttula and colleagues (1998) in anticipation of a rise in the conservation pool. This survey extended past the southern part of the reservoir area covered by Wyckoff (1961), going north all the way to Buffalo Creek. Following the survey, Perttula and Nelson (2004) conducted test excavations at five sites to determine their eligibility for inclusion in the National Register of Historic Places. Two of these sites (34Mc402 and 34Mc848) had Caddo components. Sundermeyer and colleagues (2004:207) also conducted testing at sites in the reservoir area, including six with Caddo components (34Mc71, 34Mc415, 34Mc425, 34Mc837, 34Mc845, and 34Mc846).

No evidence of permanent settlement was found at any of the recently-studied sites, although excavations were not as extensive as those undertaken by the Oklahoma River Basin Survey in the 1960s. In 2009, however, the U.S. Forest Service located the Ramos Creek site (34Mc1030). This is the northernmost Caddo site known for this drainage, roughly 15 km north of Woods Mound Group. Shovel tests demonstrated that deposits at the site were largely intact and extended across more than 9 hectares. Test excavations at Ramos Creek, which is located in the Ouachita National Forest, were conducted in 2010 during a field school run by the University of Oklahoma and the Oklahoma Archeological Survey. This project was undertaken through an Archaeological Resources Protection Act (ARPA) permit to assist the U.S. Forest Service fulfill their Section 106 responsibilities under the National Historic Preservation Act (NHPA).

For this project I am only focusing on the six Caddo sites with evidence of permanent settlements: Beaver, Hughes, E. Johnson, Woods Mound Group, Biggham Creek, and Ramos Creek. My analysis of chronological and social relationships between communities relies heavily on pottery sherds and these sites have the largest sample sizes by far. Additionally, I am interested in comparing the assemblages present at non-mound domestic settlements to those at presumably ceremonial mound sites.

The Caddo sites along the upper Mountain Fork are distributed along an approximately 27-km span of the river (Figure 3.3). Most of the known permanent settlements were located in the southern half of this extent, under the present-day reservoir. The only known permanent settlement in the northern extent is Ramos Creek, although it is important to remember that no surveys have been conducted much further north than this site, where the steep slopes and narrow valleys of the Broken Bow Uplift yield to the broader valleys and terraces of the central belt.

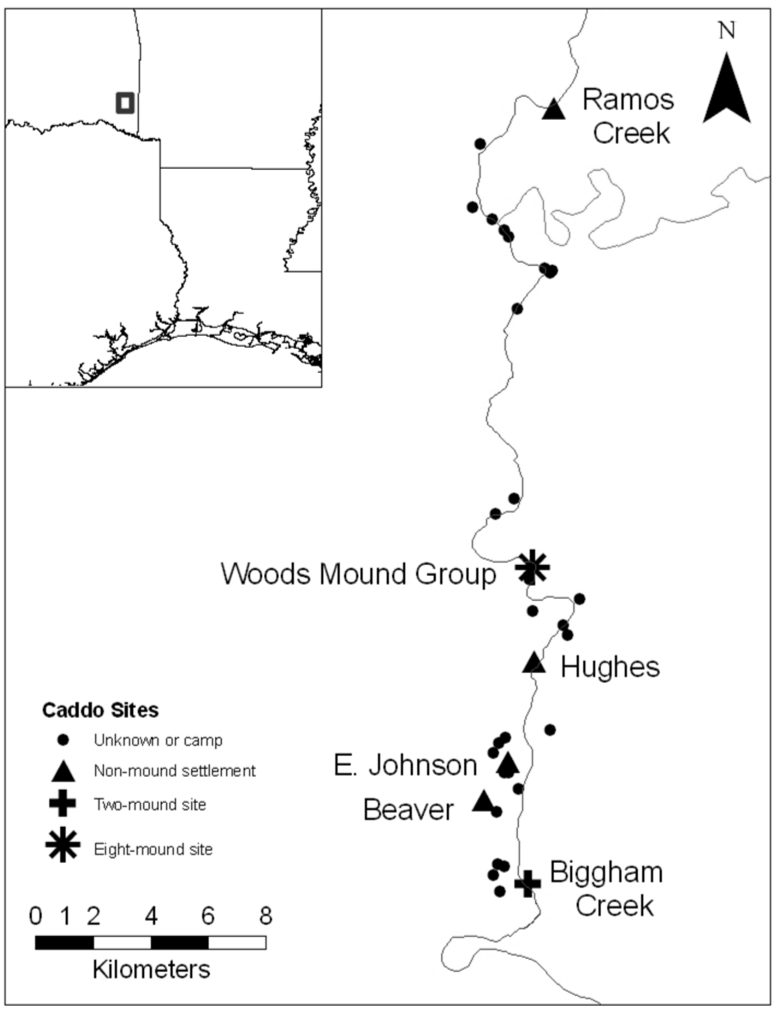


Figure 3.3. Caddo sites along the Mountain Fork.

The following site descriptions first address the non-mound settlements and then look at the two mound sites, Woods and Biggham Creek. A discussion of radiocarbon dates is conspicuously absent here because they will be addressed at a later point in relation to the pottery analysis. Here I focus on a basic description of position on the landscape, stratigraphy, and features present at each site.

Beaver (34Mc1)

The southernmost known non-mound settlement along this part of the Mountain Fork was the Beaver site. Beaver was located on a second terrace of the Mountain Fork, near Cedar Creek (Wyckoff 1968:8). It was first reported in 1955, visited by Wyckoff in 1961, and slated for excavation in 1964-5. The site was expansive, covering approximately eight acres across the terrace (Figure 3.4). Excavation involved both controlled manual excavation and mechanical stripping (Wyckoff 1968:11-12). The controlled excavations took place in six areas, Grid A and Test Trenches I-V, in which 192.8 square meters (2075 square feet) were excavated and 158.7 cubic meters of earth were removed. Excavation units were five by five foot square. Most of the units were dug in six-inch arbitrary levels, except for Grid A where four-inch arbitrary levels were used through Level 12 to get better vertical resolution. Most of the fill from the controlled excavations was screened through quarter-inch mesh hardware cloth. After the controlled excavations, a bulldozer was used to strip away 22 large areas of the topsoil in order to more efficiently locate features.

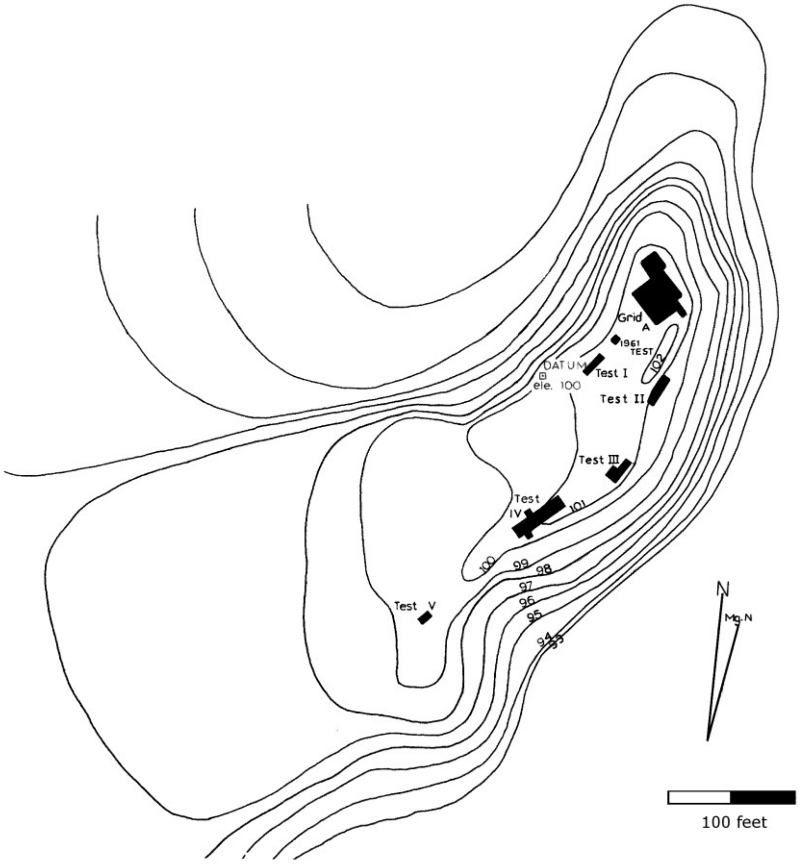


Figure 3.4. Beaver site with controlled excavation areas marked (adapted from Wyckoff 1968:Figure 1).

The stratigraphy at Beaver consisted of six horizons (Wyckoff 1968:12-15). From top to bottom these included a grey-brown sandy-silt plow zone, a thin layer of banded silt interpreted as the remnant of a previous plowzone (only in Test Trench IV), a midden deposit of black sandy loam or alternatively a layer of tan sandy loam, a brown sandy clay interpreted as a buried and eroded soil, and finally a red clay subsoil. In Grid A, the midden layer was about 60 cm thick and the subsoil began approximately 150 cm below the surface (Figure 3.5).

Figure 3.5. Two photographs from 1964 of the stratigraphy at Beaver Grid A. On the left is the east wall of N8-R2. On the right is the southeast corner of N3-R1, with a marker 18 inches long.

Features uncovered at Beaver included three sets of posthole patterns and an associated hearth and trash pit. The first set of postholes (referred to in Wyckoff 1968:16 as House Pattern 1) was found in the northeastern part of the site (Figure 3.6). They outlined a rectangular structure oriented along the semi-cardinal directions with an extended entrance to the southeast. The structure measured 5.8 by 4.3 meters and the entranceway appeared to be about 1.2 meters long. The parallel lines of postholes suggest that either structure was built with an interior and exterior set of posts or it was rebuilt in situ. Two centerposts and a hearth (91 by 66 cm) were present within the structure. No charcoal or daub fragments were present and so the structure probably was not burned. Few artifacts were found within: one point fragment, three human teeth, four fragments of unidentified bone, 19 pottery sherds, and one small undecorated bottle.

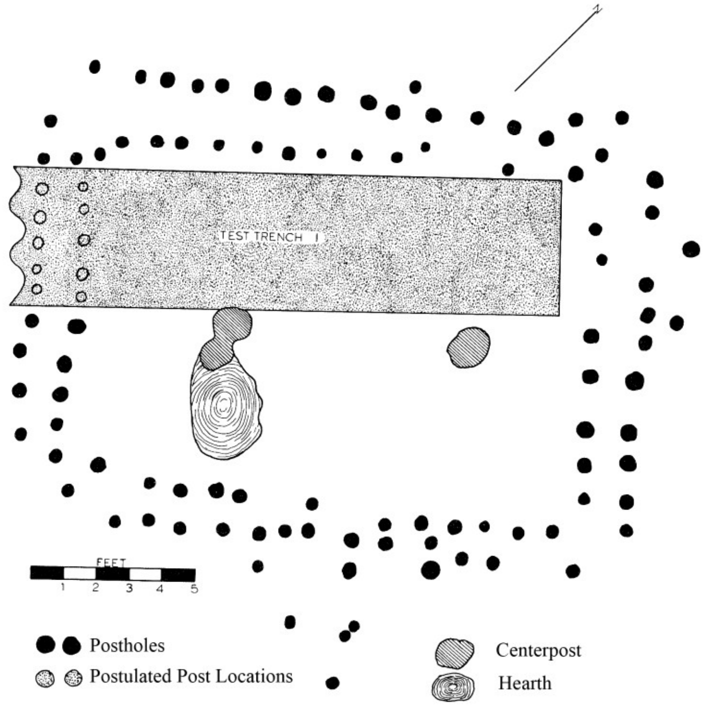


Figure 3.6. Beaver, posthole pattern #1 (adapted from Wyckoff 1968:Figure 6).

The second set of postholes was found about 13 m east-southeast of House Pattern 1. Wyckoff (1968:16-18) interpreted this set as roughly rectangular, but it is difficult to discern (Figure 3.7). Two larger postholes may be present within the confines of the smaller postholes. No daub was found, nor a hearth. One pottery sherd and a point were found in the postholes. It is possible that these postholes represent a ramada (shaded arbor) or granary rather than a house. According to the Terán map of 1691, the house compounds of the Upper Nasoni along the Red River consisted of clusters that included all three types of structures.

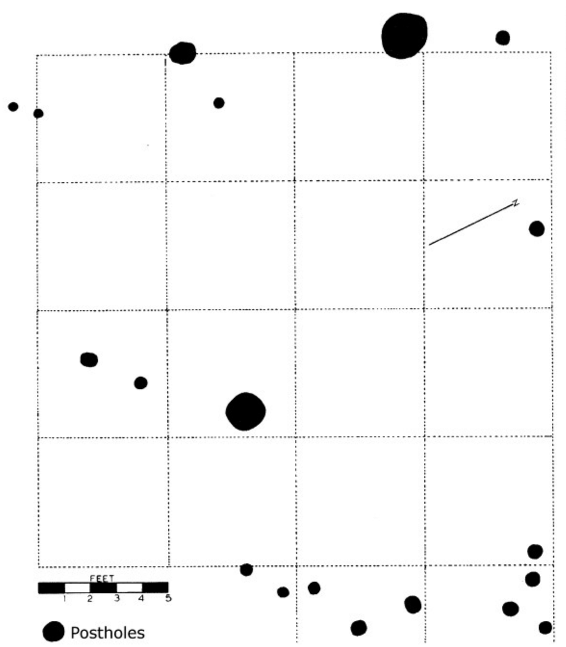


Figure 3.7. Beaver, posthole pattern #2 (adapted from Wyckoff 1968:Figure 7).

The third set of postholes more likely represents a house because of the higher density of postholes, although the outline is again unclear (Figure 3.8). This set was located on the southwestern part of the terrace, about 108 meters from House Pattern 1. Wyckoff (1968:18) originally suggested that both curved and straight walls were present, although no hearth was located. Possibly the postholes represent multiple structures, whose limits were outside the extent of the excavated area. A trash pit was located nearby, containing lithic debitage, burned acorn fragments, and some pottery sherds.

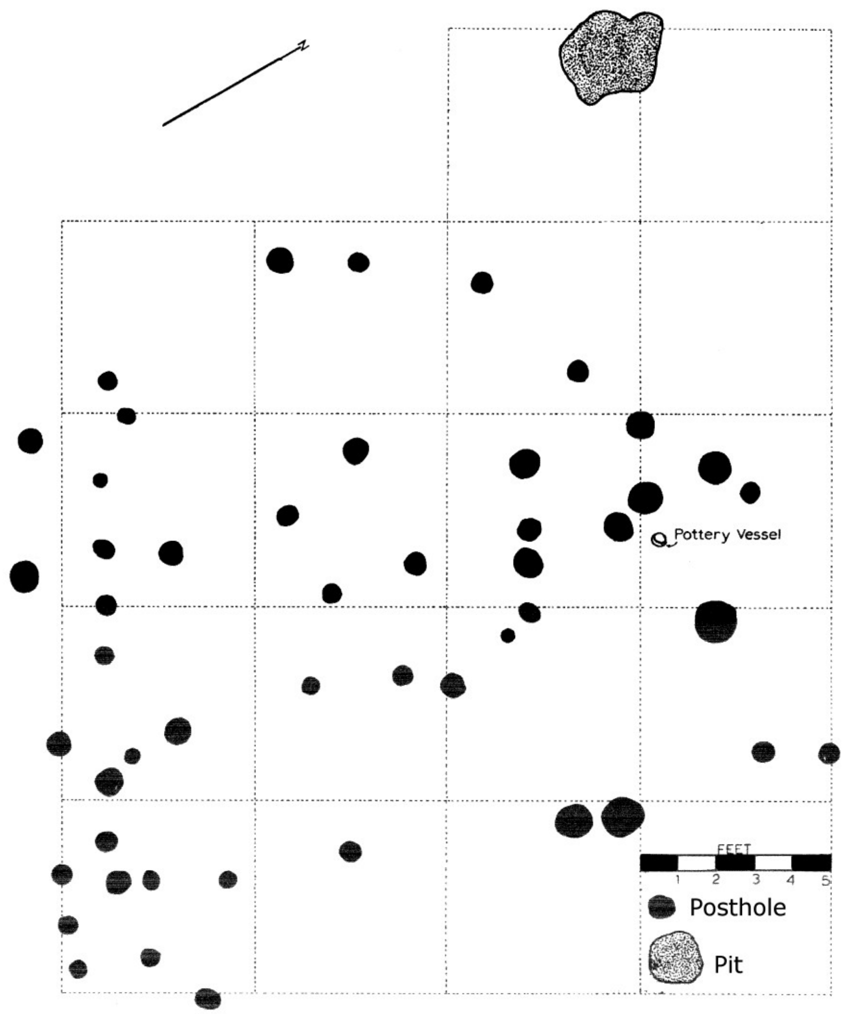


Figure 3.8. Beaver, posthole pattern #3 (adapted from Wyckoff 1968:Figure 8).

The excavations uncovered 18 burials at Beaver (Table 3.1; Wyckoff 1968:18-25). Most of these were primary burials of individuals' whose bodies were extended with their heads positioned towards the southeast. Some of the people were accompanied by grave goods, including pottery vessels and in a few cases projectile points, a celt, and a lump of greenish clay. Based on the disposition of the body (secondary or flexed) and on chronologically-diagnostic grave goods, a few of the individuals (those from burials 1, 2, 4, 9, and 18) probably lived here before A.D. 1350 (Wyckoff

1968:175). The others more like lived here during a later occupation, in some cases post-dating A.D. 1500.

Table 3.1. Burials at the Beaver site (Wyckoff 1968:18-25).

Burial Number	Location	Primary/ Secondary	Position of Body	Position of Head	Funerary Objects
1	Grid A	Primary	Flexed	North	--
2	Grid A	Primary	Flexed (bundle?)	East	1 vessel
3	Grid A	Primary	Extended	East	--
4	Grid A	Primary	Extended?	East	5 vessels, 1 celt
5	Grid A	Primary	Extended	East	2 vessels
6	Test Trench IV	Primary	Extended	Southeast	3 vessels, 1 quartzite core, 4 points
7	Test Trench IV	Primary	Extended	Southeast	1 vessel
8	Test Trench IV	Primary	Extended	?	2 vessels, 1 containing mussel shell and broken clay pipe
9	Test Trench III	Secondary?	Extended?	Northwest	Burned mussel shell
10	Northern extent	Primary	Extended	Southeast	2 vessels
11	Central	Primary	Extended	Southeast	2 vessels
12	Near HP1	Primary	Extended	Southeast	3 vessels, greenish clay-like material
13	Central	Primary	Extended	Southeast	--
14	Near HP1	Primary	Extended	Southeast	1 vessel
15	Near HP1	Primary	Extended	Southeast	4 vessels
16	Near HP1	Primary	Extended	Southeast	None
17	Near HP1	Primary	Extended	Southeast	5 vessels, 2 points
18	Near HP1	?	Not articulated	?	None

Additional features at Beaver included two more refuse pits (F1 and F4), two sets of vessels (F2 and F3) that did not appear to accompany an interment, and some postholes that did not belong to any discernable pattern (Wyckoff 1968:25-26). Artifacts at Beaver were abundant and indicate that the site was occupied prior to the Caddo period (Wyckoff 1968). Large projectile points included Gary, Langtry, Shumla, Bulverde, Castroville, Edgewood, Ellis, Marshall, Montell, Palmillas, Travis, Williams, Yarbrough, Carollton, and Ensor points. Small projectile points included Agee, Alba, Bassett, Bonham, Catahoula, Friley, Hayes, Scallorn, Reed, Washita, Fresno, Granbury, Talco, and Young points. Amongst the chipped stone artifacts were double-bitted axes, a burin, choppers, cores, core knives, drills, gravers, hoes, knives, and scrapers. Ground stone materials included abraders, hammerstones, celts, possibly part of an earspool, cupstones/nutting stones, gorget fragments, grinding stones, and grinding basins. Finally, along with the whole vessels, 6602 pottery sherds were found. Other items included one complete and two fragmentary perforated pottery discs and five fragments of clay pipes (Wyckoff 1968:128-129).

E. Johnson (34Mc54)

The next non-mound settlement to the north of Beaver was E. Johnson, a large site located on a first terrace of the Mountain Fork near Egypt Creek (Figure 3.9). E. Johnson was first located by Wyckoff in 1961. Following testing that year, excavations were scheduled for 1964-5. The site was spread over approximately seven acres, with the most concentrated evidence of occupation on the southern four acres of the terrace (Wyckoff 1967b:11). This area was one to two feet higher than the acreage to the north, which could have been an important consideration for residents seeking to avoid floodwaters.

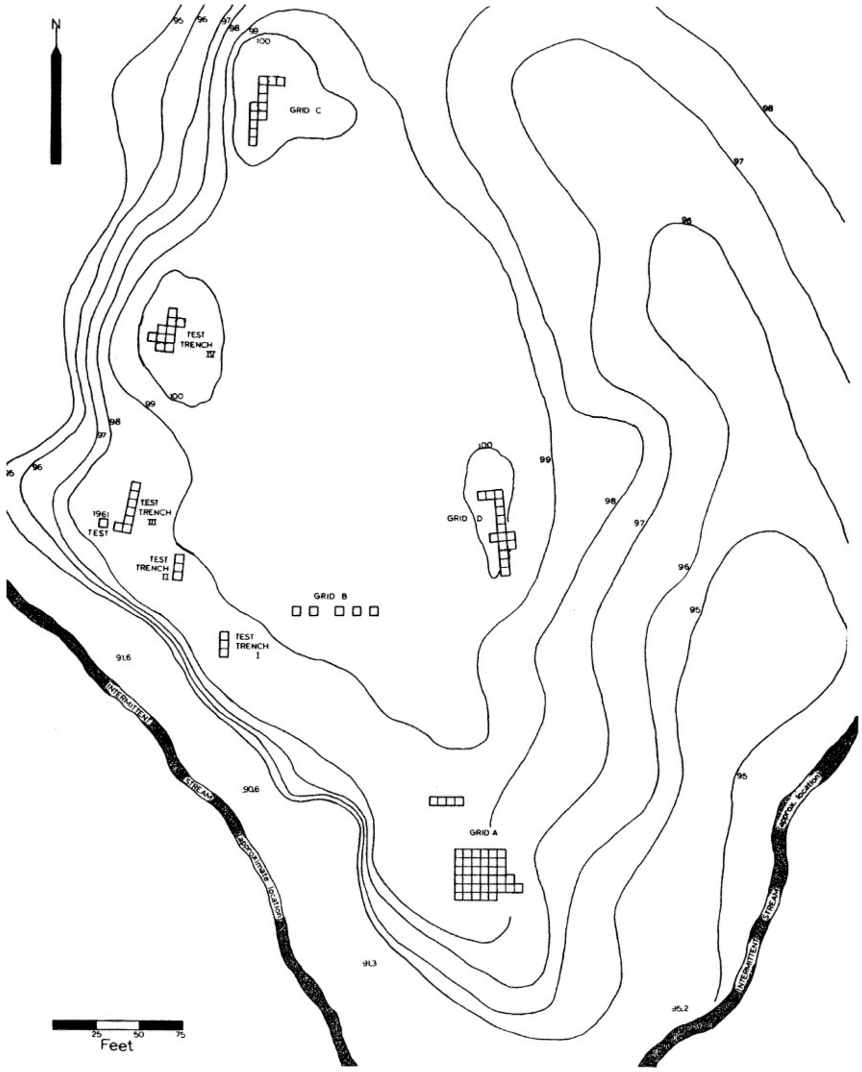


Figure 3.9. E. Johnson site with controlled excavation areas marked (adapted from Wyckoff 1967b:Figure 2).

As at Beaver, excavations at E. Johnson included both controlled manual excavations and mechanical stripping (Wyckoff 1967b:14-17). Nine blocks were excavated manually in five-foot squares and six-inch levels. These included one test unit in 1961, four grids for area excavation, and four test trenches. Twenty areas were mechanically stripped in order to search for features more efficiently. During the manual excavations, 227.6 square meters (2450 square feet) were excavated and 125.7 cubic meters of earth were removed.

The stratigraphy at E. Johnson consisted of four horizons (Wyckoff 1967b:17-19). A tan sandy plow zone was on top, over a midden layer of brown, sandy loam, then a layer of yellow-brown sandy soil, and then a tan mottled sand. The lowest layer began around 60 cm below the surface in Test Trench I, which is the only place where it was detected. Across the rest of the site this layer must have occurred lower than the excavated depths.

Two clusters of postholes were found at E. Johnson (Wyckoff 1967b:20-22, 34). The first, labeled as House Pattern 1, was located on the southern part of the terrace. It consisted of 15 smaller postholes, one larger potential centerpost, and a small area of baked clay interpreted as the remains of a prepared hearth (Figure 3.10). A milling basin fragment was found lying horizontally 25 cm below the surface, possibly indicating the depth of the original floor. No daub was found. Two burials (B1 and B2) were located near the perimeter of the structure. The structure may have been circular, but it is very hard to tell.

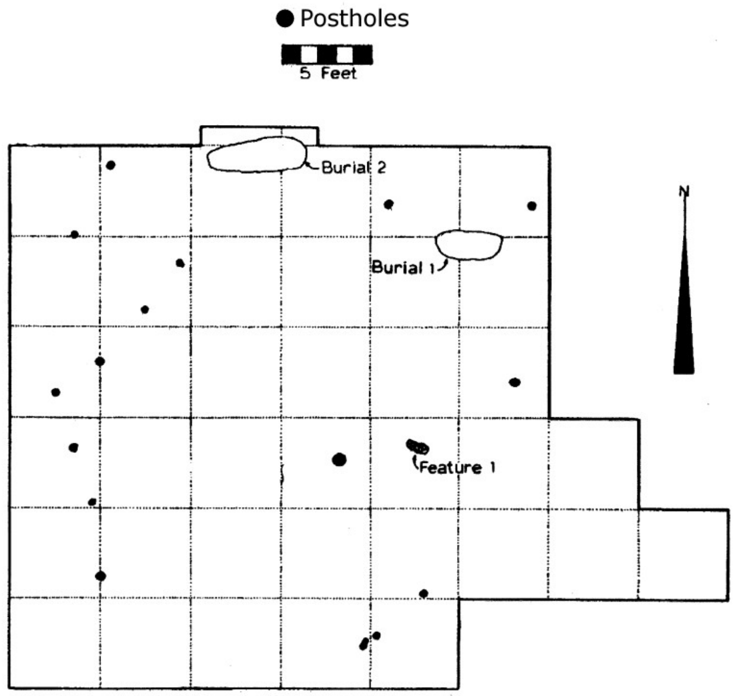


Figure 3.10. E. Johnson, posthole pattern #1 (adapted from Wyckoff 1967b:Figure 6).

The second cluster of postholes (House Pattern 2) was located about 45 meters north of the first (Wyckoff 1967b:21-22). It consisted of 48 postholes (Figure 3.11). Again, the structure may have been circular, but also could have been rectangular; the postholes were too irregularly spaced to discern the pattern. No daub was found here either. One elongated pit was located within or near the edge of the structure. This could have been a burial pit, but it was longer than most and contained no trace of skeletal remains.

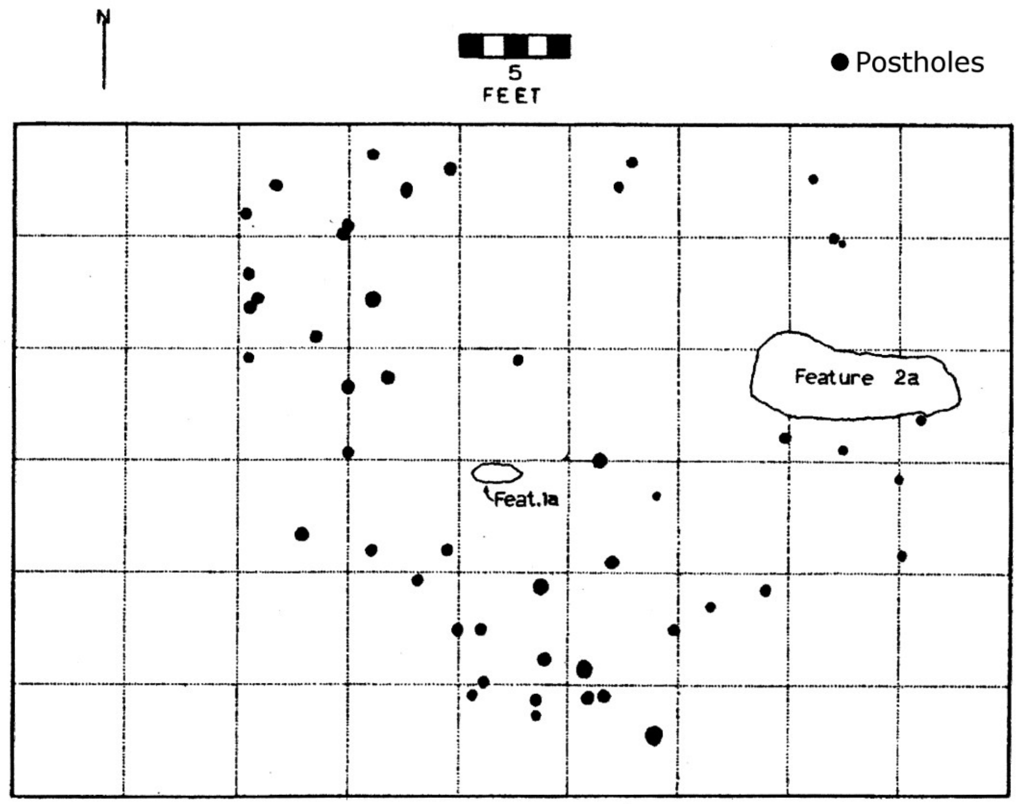


Figure 3.11. E. Johnson, posthole pattern #2 (adapted from Wyckoff 1967b:Figure 7).

Excavations uncovered 11 burials from the Caddo period and two historic Choctaw burials (Table 3.2; Wyckoff 1967b:24-34). Preservation was poor across the site, but most of the Caddo burials were probably primary with the bodies extended and the individuals' heads most often positioned towards the east or northeast. Most of these people were accompanied by one or more pottery vessels, along with a spatulate celt in one case and a mussel shell in another.

Table 3.2. Caddo burials at E. Johnson (Wyckoff 1967b:24-34).

Burial Number	Location	Primary/ Secondary	Position of Body	Position of Head	Funerary Objects
1	Grid A	Primary?	Extended	East	2 vessels
2	Grid A	Primary?	Extended	East	2 vessels
3	Graded Strip C	Primary?	Extended	?	1 vessel
4	Graded Strip D	Primary?	Extended	Northeast	1 point? (possibly incidental)
5	Graded Strip E	Primary?	Semi-flexed?	Northeast	2 vessels, 1 spatulate celt
8	Graded Area EE	Primary?	Extended	East	1 vessel
9	Graded Area JJ	Primary?	Extended?	?	3 vessels
10	Grade Area 00	Primary?	Extended?	?	None
11	Graded Area LL	Primary?	Extended?	?	2 vessels, 1 mussel shell
12	Graded Area LL	Primary?	Extended?	?	1 vessel
13	Graded Area 13	Primary?	Extended?	East	4 vessels

Other features at E. Johnson included several vessels (F3 and F4) that were not directly associated with burials (although they might once have been), two refuse pits (F5 and F8), and another area of baked clay accompanied by scattered charcoal pieces (F6) (Wyckoff 1967b:34-35). This last feature was likely the remains of another prepared fire basin.

As at Beaver, E. Johnson was also occupied during the Archaic and Woodland periods as reflected in the chipped stone assemblage (Wyckoff 1967b). Large projectile points included Desmuke, Gary, Langtry, Ledbetter, Bulverde, Castroville, Dalton, Ellis, Fairland, Lange, Marcos, Marshall, Palmillas, Williams, Yarbrough, Carrollton, Darl, Morhiss, and Catan points. Small points included Agee, Alba, Bonham, Catahoula, Friley, Homan, Scallorn, Reed, Washita, Fresno, Granbuy, Maud, Talco, and Young points. Other chipped stone artifacts in the assemblage were choppers, cores, core knives, hoes, knives, reamers, and scrapers. Ground stone tools included celts, cupstones/nutting stones, hammerstones, grinding stones, grinding basins, and slate pendants. Along with the pottery vessels, 5481 pottery sherds were found at E.

Johnson. Other items included three fragments of pottery discs and two fragments of clay pipes (Wyckoff 1967b:143-144).

Hughes (34Mc21)

The Hughes site was located on a second terrace near Bee Creek, approximately a quarter mile west of the Mountain Fork (Figure 3.12). It was first reported by Dr. Sherman Lawton in 1956 and was later visited by Wyckoff (1961, 1966), who led nine days of excavation in 1964. Units were placed in four excavation blocks, labeled Trenches I-IV, which spanned the terrace. Five-foot squares were excavated in six-inch arbitrary levels and fill was screened through quarter-inch mesh hardware cloth. A total of 74.3 square meters (800 square feet) were excavated and 32.9 cubic meters of earth were removed. The site's stratigraphy was defined by a disturbed plow zone underlain by a tan sandy soil and then by a red clay subsoil (Wyckoff 1966:13). The subsoil appeared at a maximum of 56 cm below the surface.

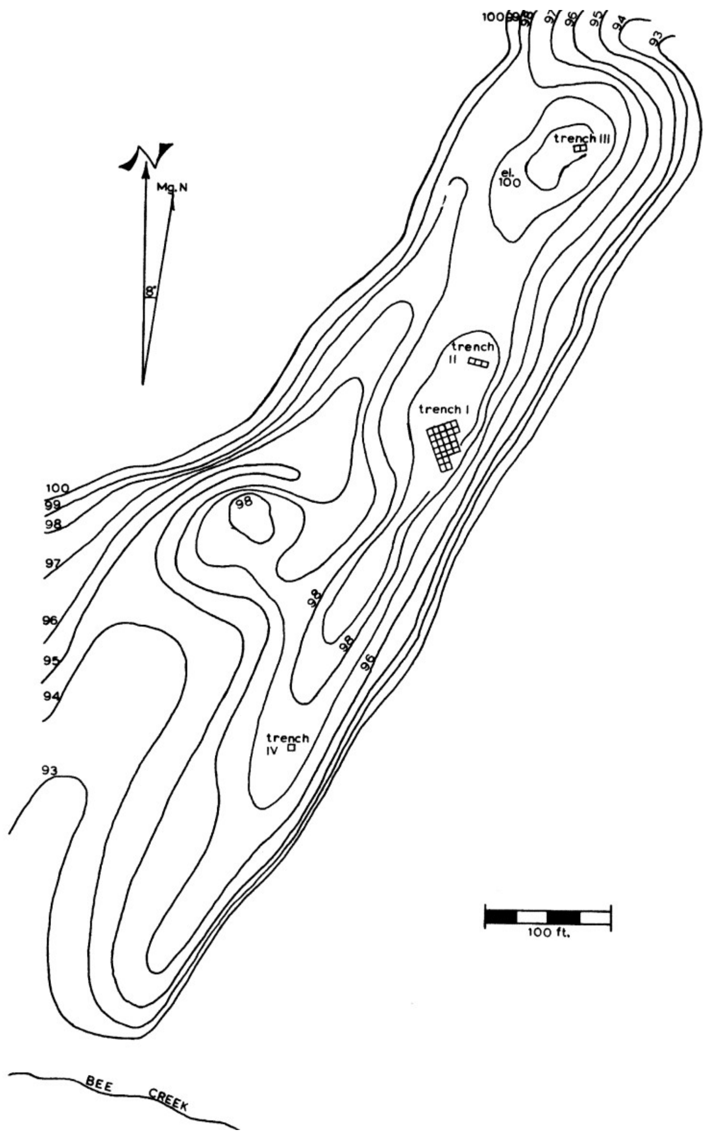


Figure 3.12. Hughes site with excavation areas marked (adapted from Wyckoff 1966:Figure 2).

The most significant excavations at Hughes took place at Trench 1, where 26 units were excavated (Wyckoff 1966:13-15). Three features and 14 postholes were uncovered. Feature 2 was an elliptical fire pit measuring 132 by 97 cm. Feature 3 was a trash pit measuring 264 by 168 cm, extending down 91 cm from the base of level 3. Feature 4 consisted of an irregular expanse of baked red clay approximately 8 cm thick. Wyckoff (1966:15) suggested that this could have possibly been the floor of a structure, except that it bore little direct relation to the postholes. The 14 postholes potentially formed two elliptical curves facing away from the three features, but were so irregularly placed that a definite pattern was difficult to discern (Figure 3.13). Regardless, the postholes and features suggest that a structure of some sort was present at this place. Nothing significant was found in the other three trenches.

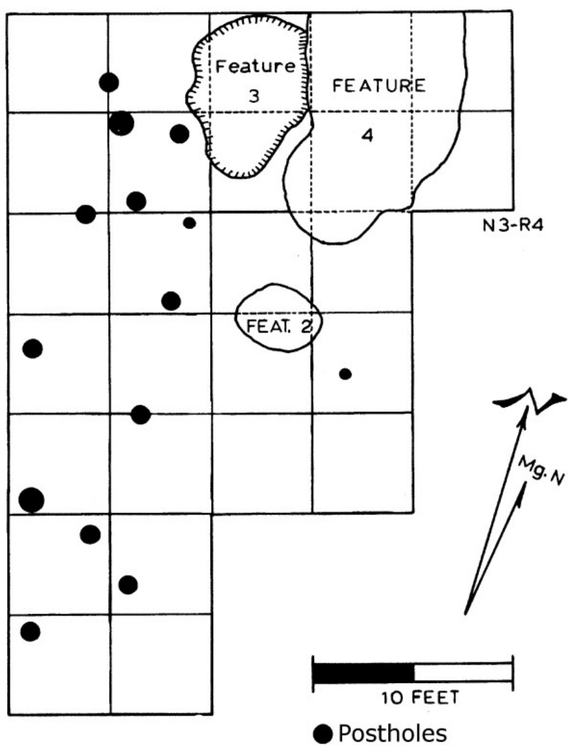


Figure 3.13. Hughes posthole pattern (adapted from Wyckoff 1966:Figure 3).

A variety of artifact types were recovered from this site, some indicating possible pre-Caddo occupation. Small projectile points included Agee, Bonham, Catahoula, Fresno, Scallorn, and Young points Wyckoff 1966:17-20). Large projectile points included Big Sandy, Bulverde, Carrollton, Edgewood, Ellis, Gary, Lange, Morhiss, Palmer, San Patrice, and Williams points (Wyckoff 1966:20-25). Other chipped stone artifacts included a chopper, core knives, cores, drills, a graver, knives, notched pebbles, and scrapers, and ground stone artifacts included celt fragments, cup stones/nutting stones, a grinding stone, a hammerstone, and a grinding basin fragment (Wyckoff 1995:25-29). The Hughes assemblage also included 575 pottery sherds.

Ramos Creek (34Mc1030)

The Ramos Creek site is considerably farther north than the other three non-mound settlements discussed so far. It is also the only site featured in this study that has not been inundated by the Broken Bow Reservoir. Ramos Creek was discovered on a survey by the U.S. Forest Service in 2009, and the following year the University of Oklahoma and the Oklahoma Archeological Survey lead a joint field school there. Excavations were conducted in order to evaluate the site's potential significance with a permit under the Archaeological Resources Protection Act.

At the site we had three major goals. First, we planned on mapping the site and conducting a series of close-interval shovel tests across the site to determine the extent of occupation. Second, we wanted to investigate an area where the Forest Service found a burned maize cob in a shovel test. Prior to the field school, a test unit placed in this location by myself and Amanda Regnier suggested that a burned structure was present. Third, we planned on placing at least two additional test units at other locations around the site to study the natural and cultural stratigraphy.

A preliminary report on the Ramos Creek site was published in the journal *Caddo Archaeology* (Dowd 2011b). The full report will be completed in the coming year after I complete the lithic analysis. Here I will only provide a summary of the excavations and materials recovered.

Ramos Creek is located on a terrace along the Mountain Fork, near the northern edge of the Broken Bow Uplift where the valley starts to widen. The initial testing by the Forest Service suggested that occupation was heaviest on the eastern and western parts of the site. Far less was found in the middle where a slough cuts through the terrace. We decided to focus our efforts on the broad eastern section of the terrace to the east and the narrower section to the west. A total of 145 shovel tests were dug across these sections (Figure 3.14). Of these, 104 were positive, indicating relatively heavy use of the landform. Pottery sherds also turned up on both sides of the site.

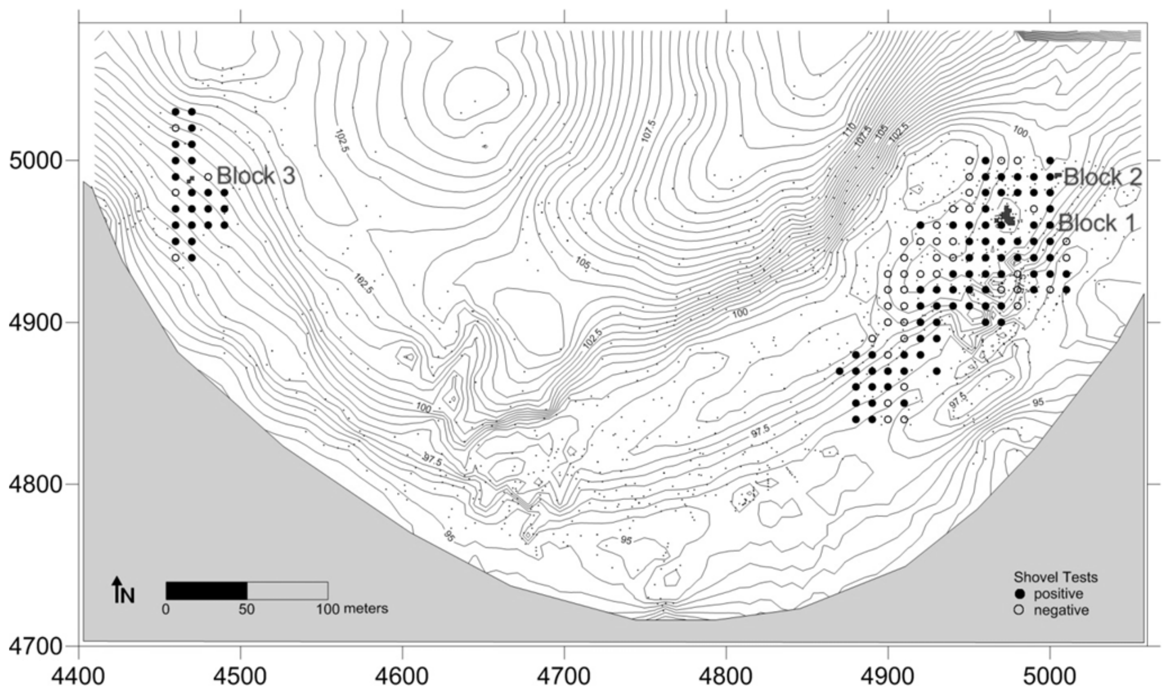


Figure 3.14. Map of Ramos Creek, showing the distribution of shovel tests and excavations conducted by the field school. Black circles indicate positive shovel tests; empty circles indicate negative tests. Location of the river is approximate.

Three areas were chosen for test excavations. Blocks 1 and 2 were on the eastern part of the site and Block 3 was on the western half. Block 1 was situated over the potential burned structure. Excavation units were mostly two meters square, unless a tree was in the way. The site was heavily forested, but luckily a small clearing was present at this location. The surface sloped slightly here. Because we wanted the levels to be even across the units in order to get the clearest possible view of the structure, for the first level all units were taken to an arbitrary depth that was approximately 20 cm below the surface in the center of the block. After that the units were excavated in 5 cm arbitrary levels until subsoil, which was 45-50 cm below the surface. In Block 1 excavations covered a total of 59 square meters and 21.8 cubic meters of earth were removed. All fill was screened through 1/4 " mesh hardware cloth except for soil samples taken for flotation.

In Block 1, a rectangular structure, possibly with rounded corners, was exposed (Figure 3.15). It measured 5.5 by 4.5 meters, with the long axis oriented northwest-southeast. There was no indication of an entrance, although we could not excavate the northeast side because of trees. Artifact density was considerably lower near the middle of the southwest side, so it is possible that the entrance was located there and that particular area was kept cleaner. Charred timber fragments were present along the perimeter and inside of the structure, suggesting that the structure was purposefully burned and smothered. Tree species present among the charred timbers included white oak and hickory. Small pieces of daub were scattered around. The perimeter of the structure was evident from a series of postholes and from the contrast between the dark interior of the structure and the tan exterior subsoil (Figure 3.16). Along with the perimeter postholes, features included a central hearth (Figure 3.17), an ash pit, a cluster of charred maize cobs in a shallow pit, a refuse pit just outside the structure, and a single center post. Artifacts present included chipped stone debitage, Reed, Fresno, and Scallorn projectile points, fire cracked rock, quartz fragments, some ground- and pecked-stone tools, and 644 pottery sherds.

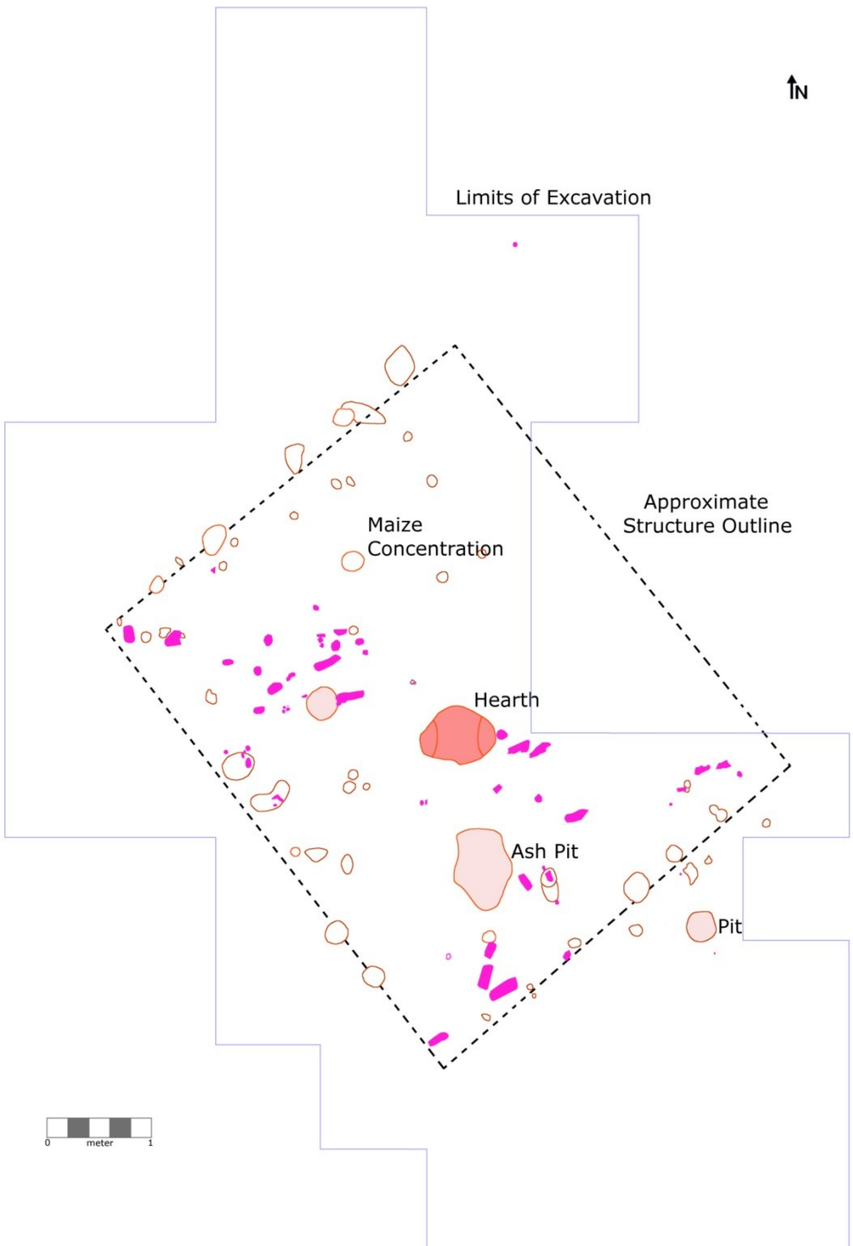


Figure 3.15. Outline of the Block 1 excavations and structure at Ramos Creek. Filled dark pink zones indicate charred timbers. Unfilled circles indicate probable postholes. The structure outline was discerned through the posthole pattern and by soil contrasts.

Figure 3.16. Ramos Creek, N4966 E4972, level 4 (40 cm below datum). The dark line running from the southwest to the northeast of the unit indicates the outline of the structure. The oval stain in the middle of the unit is the remainder of a test unit.

Figure 3.17. Ramos Creek, N4964 E4974, level 4 (40 cm below datum). Central hearth, grinding stones, and large rock present in the Block 1 structure.

Block 2 was located approximately 35 meters northeast of Block 1. An Archaic point was found at this location in a shovel test and so a pair of two-square meter units were placed here to investigate a potential Archaic component and to get a better picture of site stratigraphy. These units were dug in 10 cm arbitrary levels. While working on the first unit a refuse pit containing Caddo pottery sherds was discovered 32 cm below the datum. No more levels were dug in this unit to preserve the pit for more careful excavation. An additional one-square meter unit was opened to the south in order to expose more of the feature.

The second two-square meter unit in Block 2 was taken down to 90 cm below the datum (Figure 3.18). The A horizon (0-45 cm) was composed of dark to dark brown silty sand. This layer had the highest artifact density. A diffuse wavy boundary at 40-50 cm below the datum separated the A horizon from a yellowish-tan sandy silt C horizon. Under this, a clear wavy boundary at 60-70 cm below the datum marked the start of a second C horizon of dark yellowish bown to red hard sandy clay. A hand auger was used to core down further to a depth of 135 cm below the datum and no change was seen.

Figure 3.18. Profile (0-90 cm) of Block 2 on the eastern side of Ramos Creek.

Block 3 was located in the western part of the site. This block was also opened to investigate a potential Archaic component, as well as to look at stratigraphy on this part of the site. Two two-square meter units were opened and excavated with 10 cm arbitrary levels. Pottery was heaviest in levels 1-3 and was gone by level 6. A gravel lens at around 50 cm below the surface marked a boundary between the late prehistoric and earlier components. Below this level a number of Archaic projectile points were present. From 80-100 cm below the datum a burned rock feature appeared, with three associated early Archaic Dalton point fragments. Although I am only analyzing the Caddo component at Ramos Creek for this analysis, discovery of the Dalton feature was exciting. Amanda Regnier of the Oklahoma Archeological Survey will be reporting more on this component at a future date.

Woods Mound Group (34Mc104)

Woods Mound Group was centrally located within the distribution of sites along the upper Mountain Fork (Wyckoff 1967c). Its position on the landscape was unique among the Mountain Fork sites. Whereas the other sites were located on terraces, Woods was situated on a high sloping bluff that sat more than 18 m over the bottomlands along the river before the Broken Bow Reservoir was constructed.

Woods was discovered by Mr. Bob Hyndman, a forester and member of the Oklahoma Anthropological Society who noticed one of the mounds while fighting a forest fire in 1962 (Wyckoff 1967c:2). The next year he brought Don Wyckoff out to the site and Wyckoff quickly realized the site’s significance. The site consisted of eight small mounds clustered into at least two distinct northern and southern groups (Figure 3.19). These groups were about 183 m apart, separated by a space with little surface debris that could have possibly been a plaza, although this is not certain since excavation was not possible in this space due to Mr. Woods' cabin. Physically, the mounds appeared quite similar to one another. They were all oval to circular in shape and truncated, ranging from 0.2-0.8 m in height with footprints ranging from 80-140 m^2. About 137 meters northwest of Mound D a scatter of lithic debitage covered about a quarter of an acre on the bluff, and about 91 meters north of Mounds E, F, and G a small quantity of debris was found on a second terrace under the bluff (Wyckoff 1967c:7). Other than those two areas, though, cultural debris was scarce.

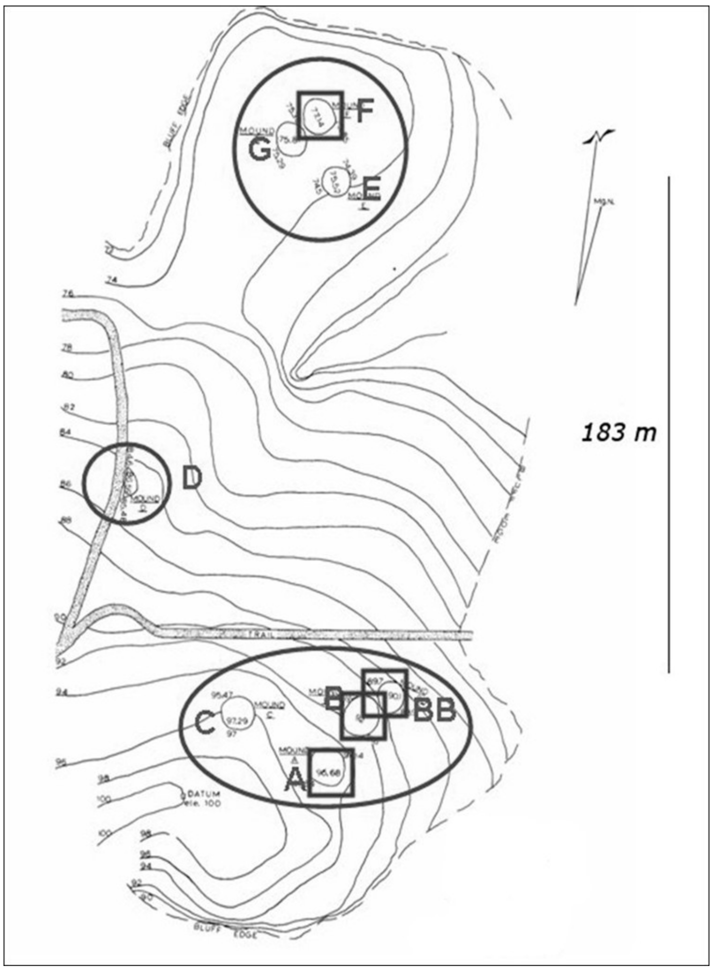


Figure 3.19. Woods Mound Group (adapted from Wyckoff 1967c:Figure 2). Mounds are marked by letter; clusters of mounds are circled. Excavated mounds are marked with a box.

Excavations were conducted in 1964-65. Four mounds were excavated; three (Mounds A, B, and BB) in the southern cluster and one (Mound F) in the northern cluster (Wyckoff 1967c:9). The mounds were dug in five-foot square units and six-inch arbitrary levels. The fill was screened through ¼ inch mesh hardware cloth, except for seven units in Mound A. During the excavation of the four mounds, a total of 299.6 square meters (3225 square feet) were excavated and approximately 157.9 cubic meters of earth were removed.

All four mounds were relatively similar, built with only one to two stages of construction (Wyckoff 1967c:10-28). The stratigraphy of Mounds A and B was nearly identical. A silty humic layer topped each mound, followed by a tan sandy loam and red-tan sandy clay (Figure 3.20). Wyckoff (1967c:10-14) interpreted these two zones as a single layer of mound fill, the first leached of clay particles that accumulated in the second. Under this a lens of grey sandy soil interpreted as a midden deposit was present in some locations in Mound A. Finally, a red silty clay subsoil underlay the mounds. Mounds BB and F also had similar profiles. The silty humic layer was once again on top underlain by the tan sandy loam and red sandy clay. In the central portion of the mounds, however, in the area outlined by postholes, a black sandy lens was present over the red sandy clay (Figure 3.21). Wyckoff (1967c:21) interpreted this as a floor zone constructed over a small primary mound. Once again the subsoil was a red silty clay.

Figure 3.20. Woods Mound A, looking northwest.

Figure 3.21. Woods Mound F, looking north. Note the black lens in the profile, interpreted as a structure floor built on a primary layer of mound fill.

Accordingly, we can reconstruct the sequence of construction (Wyckoff 1967c:10-28). A small primary platform of earth was built up under Mounds BB and F. Then a structure was built under each of the four mounds and was later burned or deconstructed. The structures were then capped with a final layer of earth, creating visible mounds on the landscape. Interestingly, Mounds A and F each had several postholes in the upper levels of the mound fill, two in F and four in A. We do not know the function of those posts, but I will explore possible explanations related to traditional Caddo ritual practices in Chapter 6.

The Mound A structure was rectilinear, possibly square with four centerposts[1] (Figure 3.22; Wyckoff 1967c:10-28). The Mound B structure had the clearest outline, rectangular with an extended entrance to the southwest (Figure 3.23). The posthole patterns under Mounds BB and F were unclear, although the Mound BB structure may have been oval (Figure 3.23, 3.24). Charred post fragments suggest the Mound F structure was burned and smothered; the others were apparently not. None of the structures had an internal hearth, although Mound A had a small (20 cm diameter) pit of charcoal within the structure and Mound B had a small mound of baked clay (53 by 33 cm) just outside the extended entrance.

[1] Part of Mound A could not be excavated because of large oak tree was present and the crew did not have the tools or expertise to cut it down (Don Wyckoff, personal communication 2012).

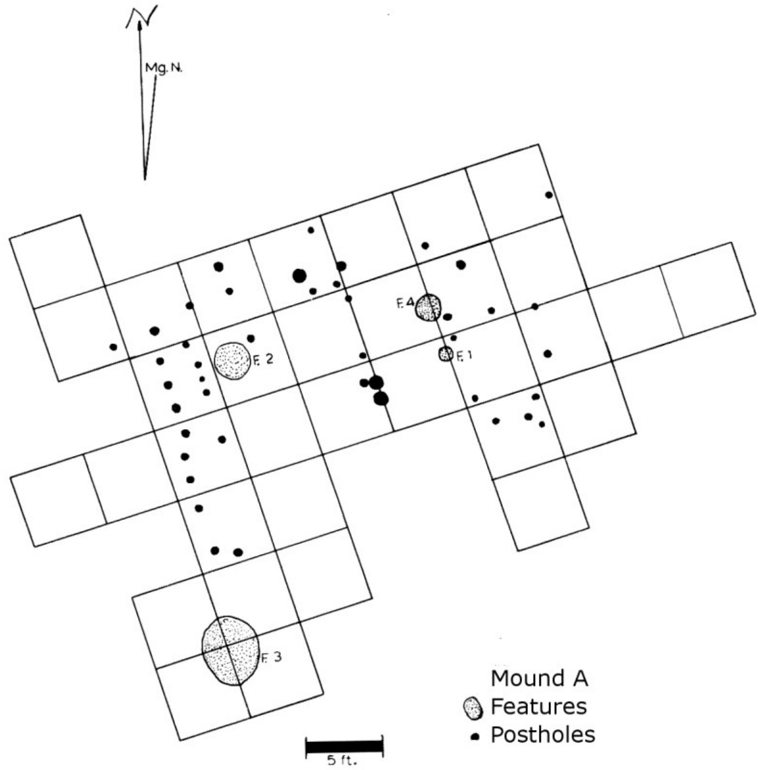


Figure 3.22. Woods Mound A, sub-mound postholes and features (adapted from Wyckoff 1967c:Figure 4).

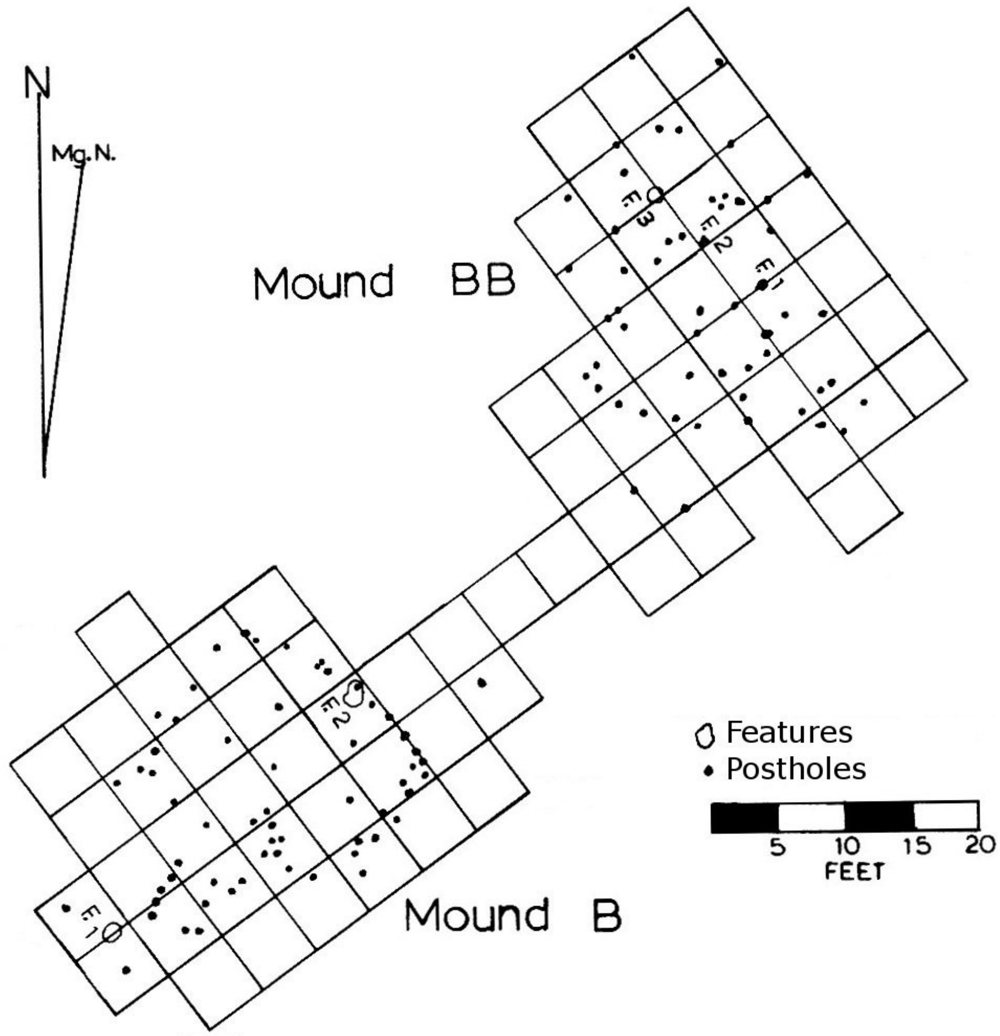


Figure 3.23. Woods Mounds B and BB, sub-mound postholes and features (adapted from Wyckoff 1967c:Figure 7).

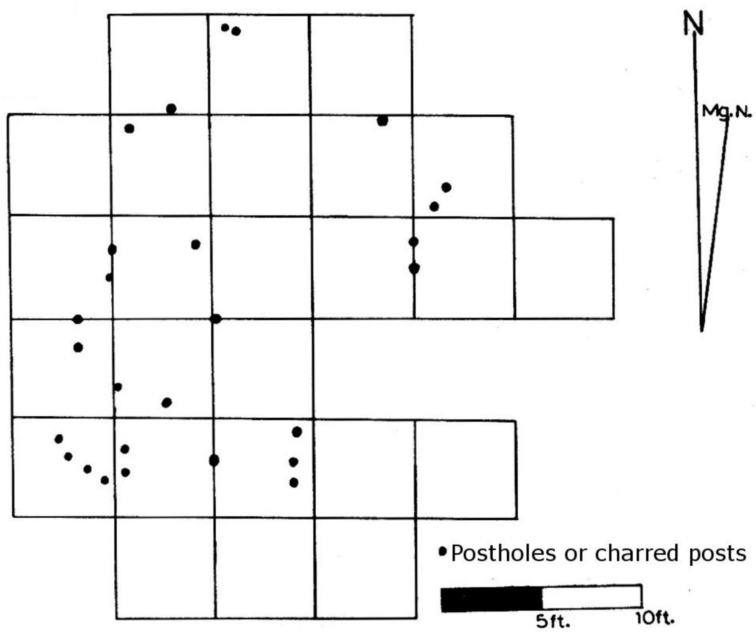


Figure 3.24. Woods Mound F, sub-mound postholes and charred posts (adapted from Wyckoff 1967c:Figure 11).

Large projectile points found at Woods included Gary, Wells, Edgewood, Ellis, Yarbrough, Plainview, Bulverde, Kirk, and Morhiss points (Wyckoff 1967c). Small points included Alba, Bonham, Fresno, Maud, Reed, Scallorn, and Young points. Some other chipped stone materials were recovered, including a chipped axe, choppers, core knives, cores, drills, hoes, knives, and scrapers. Ground-stone objects included a few celt fragments, a couple of cupstones/nutting stones, grinding stones, and hammerstones.

Three elbow pipes were found (Wyckoff 1967c:47-48, 60). One, from Mound F, was made of a fine-grained sandstone or siltstone engraved with a simple series of parallel lines (Figure 3.25). This pipe is similar to those common to Fort Coffee phase sites in the Arkansas River basin (Orr 1946 Figure 34*u*; Don Wyckoff, personal communication

2012). The other two were made of clay and were recovered from Mounds A and B. No whole pottery vessels were present, but 2213 sherds were found in the mounds. Remarkably, almost all of these sherds were from utility wares, unlike at all the other sites where more finely decorated wares made up higher proportions of the assemblages. Possible reasons for this discrepancy will be examined in Chapters 5 and 6.

Figure 3.25. Stone elbow pipe from Woods Mound F (scale in cm).

Biggham Creek (34Mc105)

Located at the very southern end of the Broken Bow Reservoir, Biggham Creek was a smaller mound site. Only two mounds were present at this site, as opposed to the eight at Woods. Biggham Creek was identified in 1964 on land being cleared prior to dam construction (Wyckoff 1965). Excavations were quickly planned for that summer.

Biggham Creek extended across approximately six acres of a second terrace, about 0.6 km from the Mountain Fork near two intermittent streams (Wyckoff 1965:11). The low, conical mounds were located on the central part of the terrace (Figure 3.26).

Lithic debitage and other artifacts were collected from the surface across the terrace, but artifact density was much higher near the mounds. Fifteen test pits were dug, but no midden was discerned (Wyckoff 1965:15-17). No dark plow zone was evident here, suggesting that the site was relatively undisturbed. The soil profile started with a brown sandy loam A-horizon that was 18-30 cm thick underlain by a red clay subsoil.

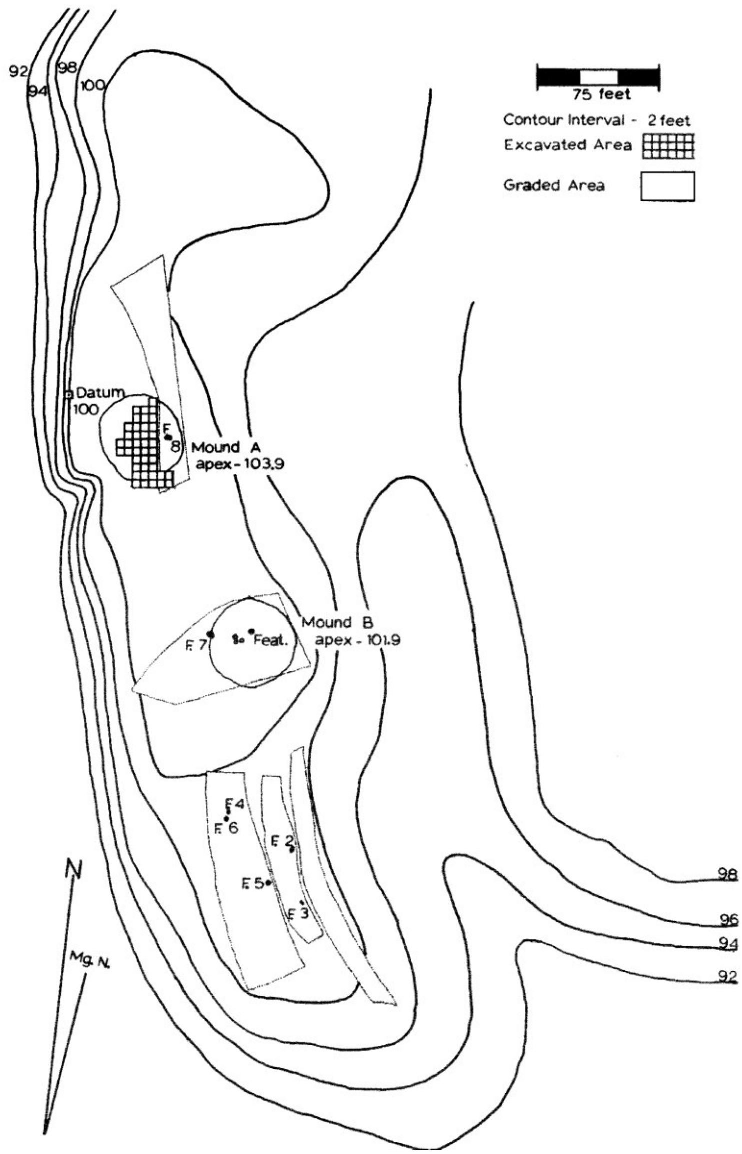


Figure 3.26. Biggham Creek site with both controlled and mechanical excavations marked (adapted from Wyckoff 1965:Figure 1).

Because a limited amount of time was available for excavation, only Mound A could be manually excavated (Wyckoff 1965:12-15). Mound A was 14.6 meters in diameter and rose 50 cm above the terrace surface. It was excavated in five-foot square units and 6 cm arbitrary levels. All of the fill was screened through ¼ inch mesh hardware cloth. The stratigraphy was almost identical to the off-mound stratigraphy. Mound fill was comprised of a brown sandy loam underlain by a red clay subsoil (Figure 3.27). Features under the mound included 16 postholes that indicated the presence of a structure, but no discernable pattern was present (Figure 3.28). Within the limits of the postholes a baked clay basin was present, 56 by 66 cm and 8-13 cm thick. During the manual excavation of Mound A, 95.2 square meters (1025 square feet) were excavated and approximately 58.05 cubic meters of earth were removed. After the manual excavations the rest of the mound was stripped with a bulldozer, revealing two refuse pits on the eastern side.

Figure 3.27. Biggham Creek Mound A, looking northwest.

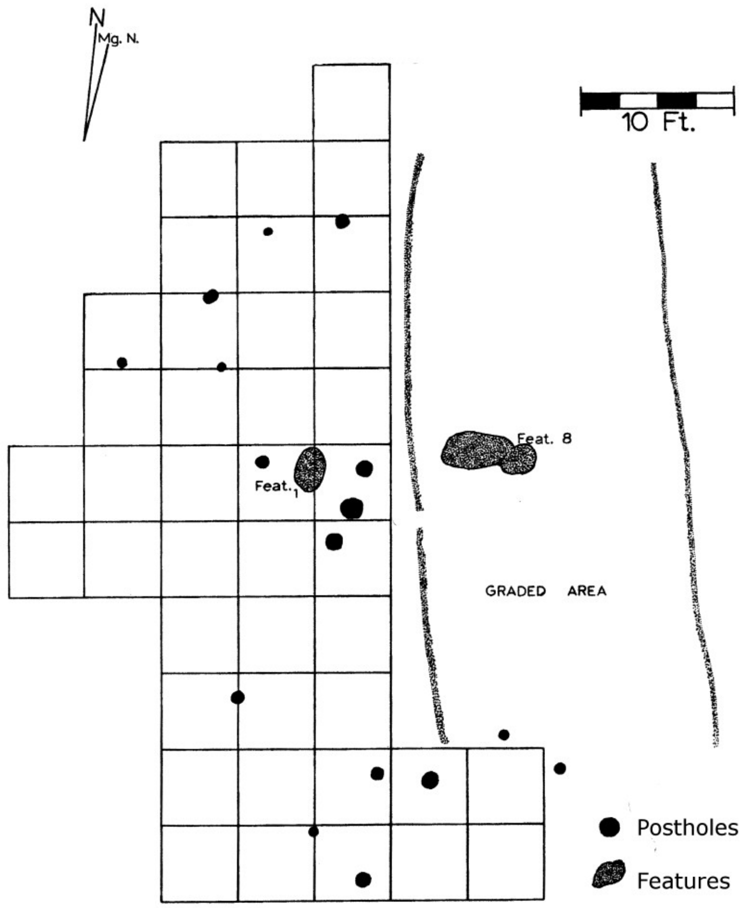


Figure 3.28. Biggham Creek, posthole pattern under Mound A (adapted from Wyckoff 1965:Figure 2).

Mechanical excavation was used to strip the topsoil off of four more areas on the site in order to more efficiently locate features (Wyckoff 1965:17-18). Mound B, located about 30 meters south-southeast of Mound A, was taken down entirely by the bulldozer. It was 16 meters in diameter and rose 34 cm above the surround land. It featured the same simple stratigraphy. Under the mound another clay basin was present, along with a refuse pit and three postholes that formed a right angle, suggesting the presence of another structure.

Three areas of the southern part of the terrace were also mechanically stripped (Wyckoff 1965:17-19). Four more refuse pits were found. Two adjacent pottery vessels were also located, but no pit outline could be seen.

Large projectile points found at Biggham Creek included Big Sandy, Bulverde, Carrollton, Dallas, Darl, Edgewood, Elam, Gary, Kirk, Lange, Langtry, Marshall, Meserve, Palmer, Plainview, San Patrice, Shumla, Wells, and Williams points (Wyckoff 1965:20-96). Small points included Agee, Alba, Bonham, Catahoula, Fresno, Livermore, Maud, Reed, Scallorn, Talco, and Young points. A number of other chipped stone tools were found including hoes, choppers, core knives, cores, double bitted axes, drills, gravers, knives, and scrapers. Pecked and ground stone tools included celts, cupstones/nutting stones, one possible discouidal, two drilled pebbles, two possible gorget fragments, grinding stones, grinding basins, and hammerstones. Three perforated pottery discs and 1253 pottery sherds were found.

Based on the mound profiles and the probable presence of structures underneath the mounds, the Biggham Creek mounds look like they were constructed in a similar manner to those at Woods. The Biggham Creek mounds, however, had baked clay fire pits within the probable limits of the structures, whereas none were present in the structures at Woods. Also, Woods was placed high on a bluff whereas Biggham Creek was located on a terrace like the other non-mound sites. Other differences exist between the two sites' chronologies and pottery assemblages that will be discussed in coming chapters.

Mountain Fork Subsistence

The Ouachita Mountains provided a rich variety of resources, including diverse knapable lithic materials, wood, and many animal and bird species. The Mountain Fork Caddo undoubtedly took advantage of game in the woods, but bone preservation is so poor in the acidic soils on the archaeological sites that very few faunal remains have been recovered. None whatsoever were found at Ramos Creek.

At Ramos Creek, however, we did have the opportunity to investigate subsistence practices through paleobotanical analysis. The presence of charred corn cobs within the Block 1 structure was strong evidence for some degree of farming by the Caddo residents. During excavations we took soil samples for paleobotanical analysis in order to learn more about what plants the Caddo may have been using at this site. The samples were processed by the Oklahoma Archeological Survey with a manual bucket flotation system and were then sent to Leslie Bush (2011) for analysis. Here I summarize the results of her report.

Bush (2011) analyzed 29 flotation samples and a hand-collected sample of corn from Ramos Creek. Most of the samples were taken from thirteen features and the fill from the structure at Block 1 (Table 3.3). Two samples were taken from the Dalton component at Block 3. Bush used standard reference volumes (Core et al. 1979; Davis 1993; Hoadley 1990; InsideWood 2004; Martin and Barkley 1961; Panshin and de Zeeuw 1980) and the comparative collections at Macrobotanical Analysis for the analysis. The full results for each sample are described in Appendix A.

Table 3.3. Botanical samples from Ramos Creek (adapted from Bush 2011:Table B.1).

Lot number(s)	Feature	Description	Liters processed
346, 347	Block 1, F4	Post mold	10.5
344, 363, 382	Block 1, F6	Ash Pit	34.5
340, 370, 371	Block 1, F7	Hearth	34
390, 391	Block 1, F8	Possible Post mold	1.5
296, 399	Block 1, F10 (also recorded as F3)	Shallow pit	1.75
423, 429	Block 1, F11	Post mold	13.5
402	Block 1, F12	Post mold	1
403, 431	Block 1, F13	Exterior pit	27.5
406	Block 1, F14	Possible Post mold	1
416	Block 1, F15	Burned patch	1.5
427	Block 1, F16, SE 1/2	Center post	16.5
428	Block 1, F16, NW 1/2	Center post	10
254	Block 1	Structure	4
339	Block 1	Structure	4
263	Block 1	Structure	4.5
215	Block 1	Structure	3
192	Block 1	Structure	8.5
373	Block 1	Structure	4.5
264	Block 1	Structure	5
265	Block 1	Structure	5
128	Block 1	Structure	3
129	Block 1	Structure	3
228	Block 1	Structure	6
267	Block 1	Structure	5
450.3	Block 1, TU 1, E 1/2	Structure	4*
448.3	Block 1, TU 1, E 1/2	Structure	hand-collected sample
301	Block 2, F5, N 1/2	Pit	14
314, 386, 394	Block 2, F5	Pit	26.5
274	Block 3	Dalton component	5
315	Block 3 F2	FCR Cluster - Dalton component	4

*estimated flotation volume

Carbonized plant remains from the Caddo component at Ramos Creek included wood charcoal, corn, a few native starchy seed fragments, nuts, a few wild seed fragments, some bulb scales and tuber fragments, and cane fragments (Table 3.4; Bush 2011).

Wood charcoal was abundant. Of the 465 fragments that could be identified, oak was the most common (46 percent) and red oak was most prevalent among the oak fragments. Pine came next, although Bush (2011) noted that much of this may be a result of modern management of the pine forest through burning. Hickory was fairly abundant (23 percent) and some maple (four percent) and red cedar (one percent) were present. The sample included single specimens of American hornbeam, chinkapin, holly, black walnut, and grape. Bush (2011) noted an apparent preference for upland species, which are the best quality woods for fuel in this region.

Table 3.4. Carbonized plant remains from the Caddo component at Ramos Creek. Approximately 253.25 liters. (Bush 2011:Table B.3).

Botanical Name	Common Name	Count	Weight (g)
Wood Charcoal			
Pinus sp.	Pine	113	1.31
Quercus subg. *Lobatae*	Red group oak	110	2.25
Quercus subg. *Quercus*	White group oak	64	0.86
Quercus sp.	Oak	35	0.49
Carya sp.	Hickory	109	1.73
Acer sp.	Maple	21	0.49
Juniperus virginiana	Eastern redcedar	8	0.11
Liquidambar styraciflua	Sweetgum	1	0.01
Castanea pumila	Chinkapin	1	0.01
Ilex sp.	Holly	1	0.01
Juglans nigra	Black walnut	1	0.02
Vitaceae	Grape family	1	0.01
Hardwood	Hardwood	27	0.33
Softwood	Softwood	1	0.02
Indeterminable	Indeterminable	2	0.03
Not examined	Not examined	3721	38.07
Bark		405	4.71
Corn (Zea mays)			
Cupules and glumes		2246	29.78
Kernels		20	0.16
Cob fragment		2	1.35
Stems			
Arundinaria gigantea	Cane	9	0.17
Poaceae	Grass family	1	0.01
Nutshell			
Carya sp.	Hickory	2368	26.81
Quercus sp.	Acorn	383	1.5

Table 3.4 cont. Carbonized plant remains from the Caddo component at Ramos Creek. Approximately 253.25 liters. (Bush 2011:Table B.3).

Botanical Name	Common Name	Count	Weight (g)
Juglandaceae	Hickory/walnut family	349	1.92
Juglans nigra	Black walnut	4	0.09
Nutmeat			
Quercus sp.	Acorn	1	0.04
Seeds			
Chenopodium/Amaranthus spp.	Cheno/am	2	
Euphorbiaceae	Spurge family	1	
Galium sp.	Stick-tight	1	
Indeterminable	Indeterminable	6	
Lamiaceae	Mint family	1	
Oxalis sp.	Woodsorrel	1	
Passiflora incarnata	Purple passionflower	1	
Polygonum erectum	Knotweed	1	
Portulaca oleracea	Purslane	1	
Rosaceae	Rose family	1	
Unknown*	Unknown	1	
Vitaceae	Grape family	1	
Other plant parts			
Rind/seedcoat		2	0.02
Pine cone fragment		1	0.29
Pine petiole		1	0.01
Geophytes			
Bulb scale		4	0.02
Tuber fragment		1	0.01
Indeterminable		575	3.63
Fungus		30	0.15
Semi-carbonized material			
Bark		31	0.24
Pine wood	Pinus sp.	37	0.36

* Globose, 0.8 x 0.7 x 0.5 mm, colliculate to reticulate, indented at probable hilum

Among the plant remains, the only clear evidence of extensively cultivated plants was corn (Bush 2011). It was present in 19 out of the 27 Caddo soil samples, with an ubiquity of 70.3 percent. Two cob fragments were complete enough to indicate 12-rowed cobs. Bush took measurements on any cupules still attached to cob fragments, and these were consistent with measurements on corn from other Caddo sites (Table 3.5 and Appendices B and C).

Table 3.5. Corn cupule (Zea mays) measurements from selected Caddo sites (measurements in mm). (Bush 2011:Table B.8).

Site	Cupule width (mm)	Cupule thickness (height, mm)	Reference
Oak Hill Village (41RK214) Fea. 85	4.7	2.18	Elson et al. 2004
Oak Hill Village (41RK214) Fea. 86*	4.84	3.08	Elson et al. 2004
41TT852	4.99	2.87	Bush 2011b
Pine Tree Mound (41HS15)	5.26	2.3	Bush 2009
Henry M. (41NA60) Lot 160b	5.37	1.5	Bush 2010a
Stallings Ranch (41LR297)	5.38	3.06	Bush 2008
Sha'chahdínnih (41MR211) Lot 175	5.9	2.4	Goldborer 2002
41TT853	5.9	2.8	Bush 2011b
Henry M. (41NA60) Lot 292	6.14	2.3	Bush 2010a
Henry M. (41NA60) Lot 160a	6.9	1.95	Bush 2010a
41SM404 Feature 1	7.05	3.36	Bush 2010b
Sha'chahdínnih (41MR211) Lot 52B	7.3	2.9	Goldborer 2002
Sha'chahdínnih (41MR211) Lot 51	8.08	3.8	Goldborer 2002
Sha'chahdínnih (41MR211) Lot 52A	9.2	3.3	Goldborer 2002
Winding Stair (3MN496)	6.5	n/a	Williams 2000
Ramos Creek (34Mc1030) Lot 448.3	8.43	3.28	Bush 2011
Ramos Creek (34Mc1030), all others	6.40	3.11	Bush 2011

*Average of measurements given in Table 91

Bush (2011) noted that the ratio of burned cupules to kernels has been used to differentiate between social practices. She interprets the ratio at Ramos Creek as indicative of standard farmstead practices, writing:

> "Analysis of corn part distribution can indicate ancient social practice because burned cupules are a by-product of corn processing, whereas kernels indicate corn consumption. In the Mississippian Moundville settlement system of west-central Alabama, there is an inverse correlation between plant processing waste and high status sites or locations (Welch and Scarry 1995:406). Simply put, in the Moundville system, corn cupules indicate non-elite activities and corn kernels indicate high status. A pattern similar to Moundville can be seen within the Pine Tree Mound site in Harrison County, Texas, where kernel:cupule ratios are between 15 and 44 times higher in the ceremonial precinct than in all other areas (Bush 2009). The kernel:cupule ratio at Ramos Creek is 0.009, a very low ratio consistent with interpretation of Ramos Creek as a farmstead where agricultural production and processing is an important activity."

Two chenopodium or amaranth seed fragments and one erect knotweed fruit were also present (Bush 2011). These may only be accidental inclusions, but it is possible that they were related to the cultivation of native starchy seeds, a practice more prevalent before the advent of corn agriculture (Bush 2011; see Fritz 1984, 2000; Johannessen 1993; Scarry 1986; Smith 1992; and Welch and Scarry 1995).

Among the nut remains, thick-shelled hickory was prevalent (75 percent by count, 88 percent by weight) (Bush 2011). Some acorn and a few pieces of black walnut were present. Bush (2011) noted that hickory was a particularly useful food source. It is high-density, rich in fat and protein, and can be processed more efficiently than other types of nuts (Fritz et al. 2001; Gardner 1997; Hall 2000:109-110; Moerman 1998:140-141; Talahay et al. 1984:353). As noted by Swanton (1994:133), the historic Caddo used a wide variety of nuts, some of which they ground before cooking with water into some sort of broth.

Although corn, or maize as it is also known, was present at Ramos Creek, it probably was only produced at the household level for the members' personal use. Limited arable farmland was available along the Mountain Fork, only enough to support farming. The land under the Broken Bow Reservoir and the land around and north of Ramos Creek would have been the most appropriate, with relatively broad terraces and some bottomlands (Figures 3.29 and 3.30). The land between the upper part of the Reservoir and Ramos Creek would have been far less appropriate because of the steep and rocky ridges lining much of that stretch of the river.

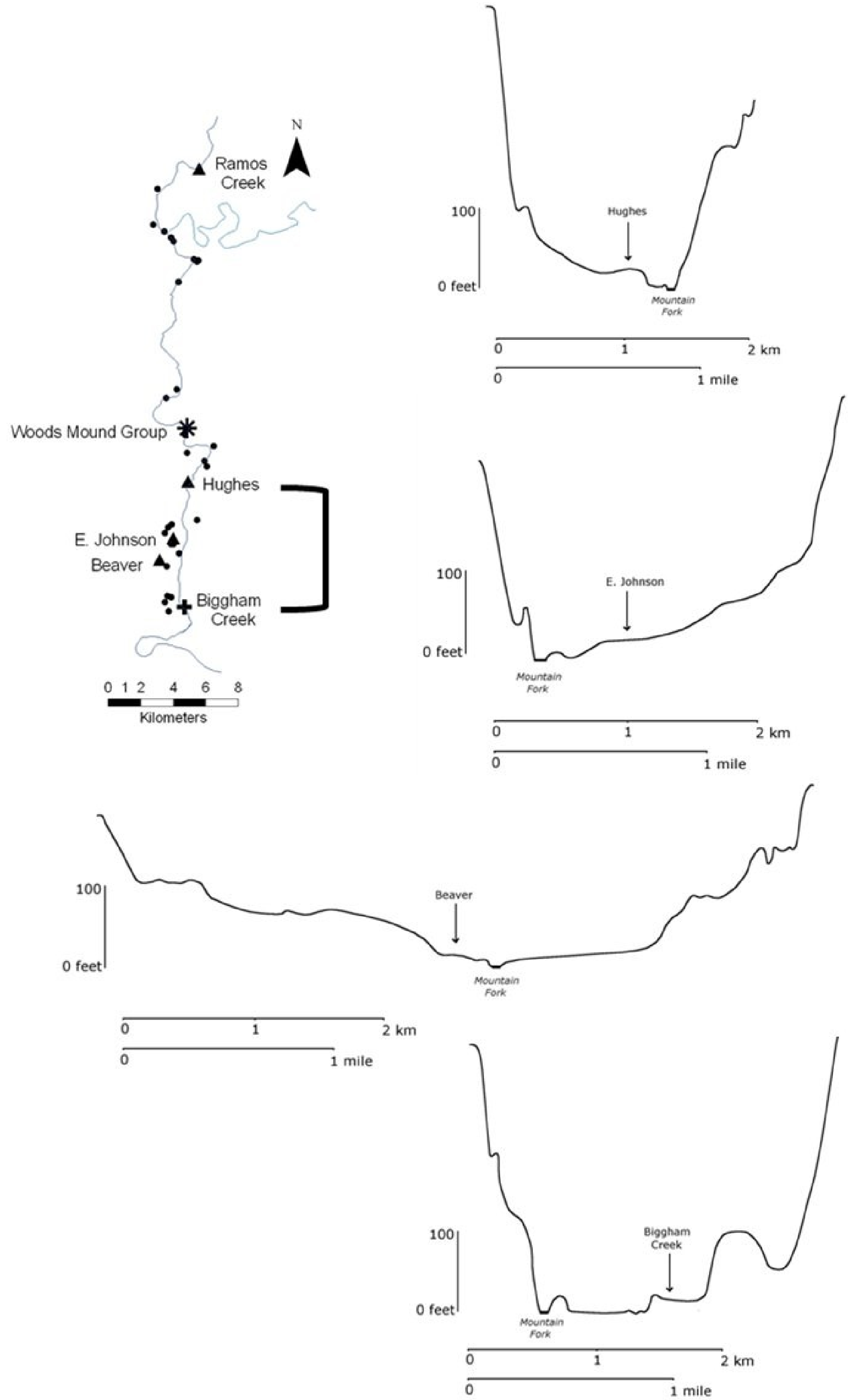


Figure 3.29. Valley profiles at Biggham Creek, Beaver, E. Johnson, and Hughes.

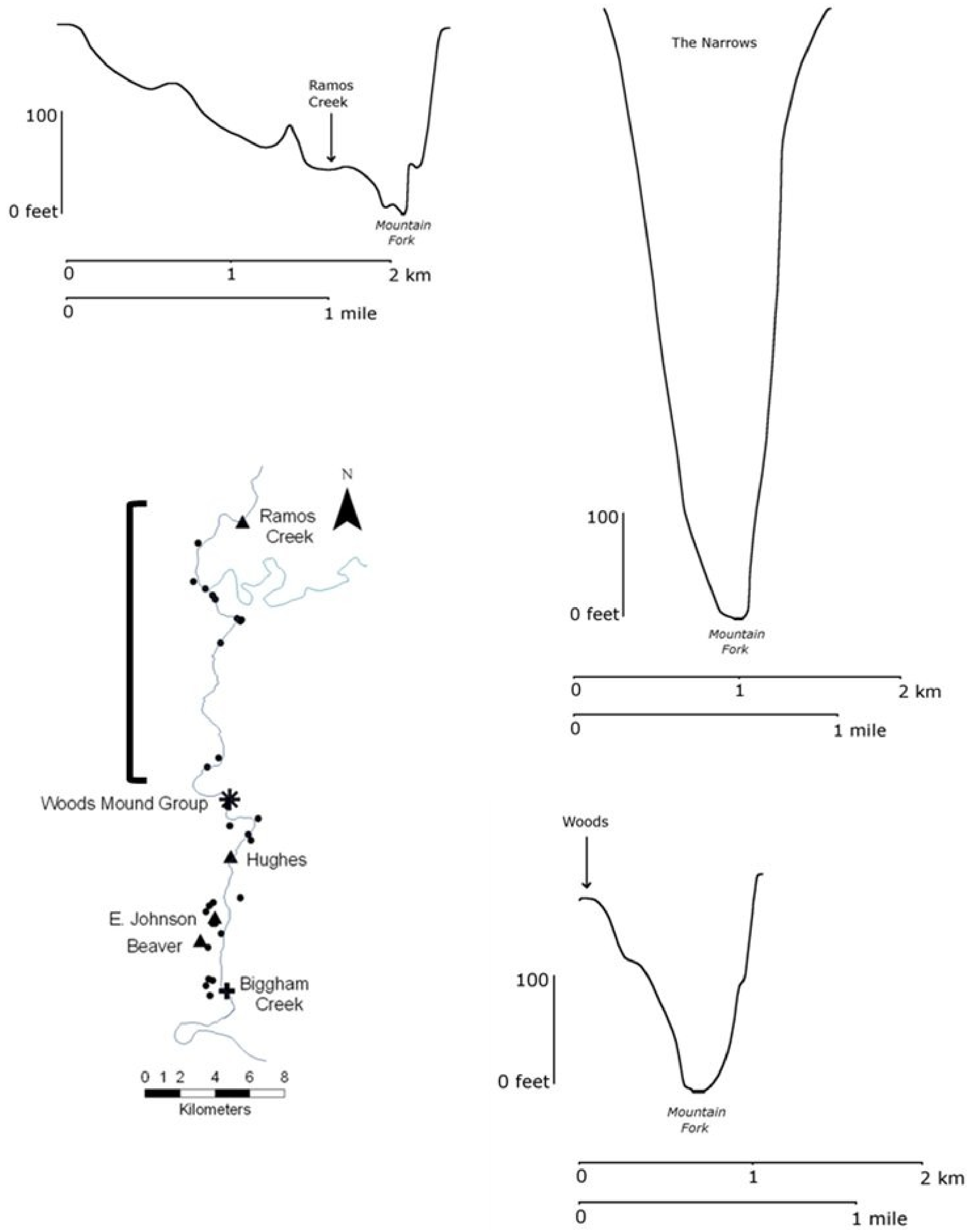


Figure 3.30. Valley profiles at Woods, the Narrows (just south of Ramos Creek), and Ramos Creek.

In conjunction with the limited area of arable land along the Mountain Fork, edaphic conditions related to the quality of the soil also restricted productivity. In a classic study of farming in the southern Maya lowlands in Guatemala, Cowgill (1962:276-277) found that maize productivity declined by up to 70 percent from after three years of farming the same plot of land without fertilizer. In order to sustain productivity, farmers had to rest a field for four years after a single crop and six to eight years after two successive crops. Although these numbers surely vary depending on local climatic and soil conditions, Cowgill's (1962) study illustrates the necessity of shifting cultivation when farming without fertilization. Maize productivity along the Mountain Fork was restricted not only by the small quantity of arable land in general, but also by the very small area of bottomlands that would be replenished by silt deposition during floods.

Maize cultivation is considered a hallmark of Mississippian societies and many think that intensification was a major factor in the development of political hierarchies (Bender 1978; Earle 1987, 1991; Fritz 1990; Griffin 1967:189; Saitta 1997; Muller 1997; Sahlins 1972; Scarry and Scarry 2005). Surplus maize, ostensibly produced for communal purposes, could be appropriated by political or ritual leaders and then used for their own advancement. However, some working in the Southeast have found that maize production and the development of sociopolitical hierarchies were not necessarily correlated (Fritz and Kidder 1993; Scarry 1993). Perttula (1996:304), looking at Caddo societies in northeast Texas, has even suggested that hierarchy decreased when maize cultivation intensified, claiming that household self-sufficiency would have lessened the influence of centralized political leaders, if indeed those leaders played a role in coordinating farming practices.

Both maize production and its relationship to sociopolitical organization remain under-studied in many parts of the Caddo area, including the southern Ouachita Mountains (Perttula 2008; but see Early 2001). This study helps to fill in that gap. Waselkov (1997:180) and Scarry and Scarry (2005) found that in many Southeastern societies households produced maize both for personal use and for communal stores. The two modes did not always overlap, though. In some societies maize was almost exclusively used for household subsistence, whereas in others communal surpluses often appropriated by leaders played a bigger role (Scarry and Scarry 2005). Ecological conditions and historical circumstances (for example, external relations with other polities) also influenced the quantity of maize cultivation and amount of surplus crop available for communal or elite use (Scarry and Scarry 2005).

Based on the limited availability and productivity of farmland along the Mountain Fork, I think it is likely that maize was mainly produced here for personal use. It is still uncertain, though, whether maize may have also been produced for communal stores. It is possible that some was given to the local *caddi* or *xinesi*, but it is impossible to know since the only paleobotanical data we have is from Ramos Creek. If local leaders were supplied with any maize, it was more of a ceremonial than day-to-day activity.

Cobb and Nassaney (2002) have argued that in some middle-range societies leaders focused on controlling ritual practices rather than economic production. Because of the importance of ritual activities at both Woods Mound Group and Biggham Creek, the relatively narrow valleys of the Mountain Fork, and current indications that household maize production was important, the Mountain Fork leaders probably depended on the control of ritual activities rather than the manipulation of communal maize surpluses to achieve prestige and status. This idea will be revisited in Chapter 7.

Summary

The Mountain Fork Caddo lived in a rich environment among the Ouachita Mountains. High-quality lithic resources including both cherts and quartzites were abundant and a diversity of plant and animal species were likely present. Although only limited quantities of land were suitable for farming, sufficient terraces existed for dispersed communities to produced maize for household use.

Substantial archaeological excavations have been conducted at six Caddo sites in this valley. These sites, Ramos Creek, Woods, Hughes, E. Johnson, Beaver, and Biggham Creek, span a 27 kilometer stretch of the river, which is within the limits of polity sizes described for other societies in the American Southeast (Hally 1993). Undoubtedly the communities living at these sites were socially connected. The chronological sequence of site occupation and degree of social integration between the communities is uncertain, however. Additionally, the presence of buried structure mounds at two of the sites, Woods and Biggham Creek, suggests that these were places where significant ritual activities occurred. Studies of leadership in the Caddo area and the broader Southeast suggest that ritual activity and political leadership were integrally connected and that sacred places were frequently venues for the acquisition of prestige and power. Examining the activities that occurred at Woods and Biggham Creek, therefore, is critical for interpreting their role in the sociopolitical organization of this society.

In sum, three major issues must be addressed in order to develop a model of sociopolitical dynamics among the Mountain Fork Caddo communities. First, the chronological sequence of occupation must be established for the six major sites. Second, social relationships between contemporaneous communities need to be addressed in order to determine the degree of social integration. Social connections between the Mountain Fork communities and neighboring regions should also be examined to study extra-regional affiliations and potential shifts in affiliation. Finally, Woods and Biggham Creek each deserve in-depth analysis and comparison in order to interpret the character of leadership and sociopolitical organization in relation to ritual practice.

I will use two major lines of evidence to address these issues, pottery and radiocarbon dates. In the next two chapters I discuss the theoretical basis for using pottery styles as a means of examining social and political relationships, describe the methods used for data collection, and describe the character of the pottery assemblages from each site. Then, in the following chapters, I evaluate this data in conjunction with radiocarbon dates from each site to analyze site chronology, inter-community and inter-regional social relationships, and the similarities and differences between Wood and Biggham Creek.

Chapter 4: Theories of Style and Social Relationships

Pottery is a particularly rich source of archaeological information in the Caddo area. Not only is this artifact class ubiquitous at sites post-dating A.D. 1000, but a large proportion was embellished with decoration. In the six major Mountain Fork assemblages, 18 percent of the total count of sherds and vessels were decorated, or 38 percent by weight. The artistic legacy of the ancestral Caddo provides a valuable source of evidence for the archaeological interpretation of their history.

In order to explore the character and dynamics of sociopolitical organization among the Mountain Fork communities, we first need a detailed roadmap of the chronological and social relationships between these communities. Styles of pottery formation and decoration play a particularly important role in helping to identify these relationships. Differences in the composition of pottery assemblages may also be helpful for distinguishing between activities at different sites and in this case will be used to look for potential differences between Woods and Biggham Creek, the two mound sites along the Mountain Fork that were evidently ritually significant places.

This chapter and the next two focus on pottery and its use in examining the social history of the Mountain Fork Caddo. The present chapter begins with a review of the history of style in archaeological thought as it pertains to pottery analysis, discussing the roles of practice theory and ethnoarchaeological studies in identifying stylistic attributes related to social behavior. The next chapter records the methodology used for this analysis and a description of the overall character of the pottery assemblages, focusing particularly on decorative types, modes, vessel forms, and vessel sizes. Finally, the third chapter uses the pottery data to explore chronological relationships, inter-site and inter-regional social relationships, and potential differentiation between the mound sites.

Archaeological Definition of Style

The term "style" lies at the heart of many archaeological studies of social identity that use stylistic similarities and differences in material culture to interpret chronological, social, and political relationships between people. Boas (1927) defined style as "fixity of type" among material culture. Others have focused on style as a quality of actions and techniques, "a way of doing something" (Dietler and Herbich 1998:135; Hegmon 1992:517; Hodder 1990:45; Wiesner 1990:105-106). The two are interrelated, with different culturally-conditioned ways of doing things and ideas about what things should look like affecting the material style of assemblages of artifacts (D'Andrade 1995; Dressler 2005).

Debates over the subject of style in archaeological thought have often been contentious. Some debate over whether stylistic variation arises from ingrained, learned techniques or from active choices. These forms of stylistic variation need not be exclusive, however. I agree with Carr (1995) and Plog (1978, 1983) who argue that style is polythetic or multivariate and that different forms of patterned material variation may be related to different social processes. When looking at pottery, this means that different aspects of stylistic variation, including attributes related to both the form of the vessel and to its decoration, should be explored, and that patterned variation among those attributes may be related to different social causes. Understanding the relationship between decorative style and social processes related to identity is particularly important for the Caddo area, where decorative wares make up such a large proportion of the assemblages.

Archaeologists have also drawn on theories of technological style (Childs 1991; Lechtman 1977), using the concept of the *chaîne opératoire* to look for style at multiple points within the sequence of the production and use of an artifact, recognizing that objects are embedded within social and cultural settings throughout their making and use. I use this concept heuristically in order to identify how and why stylistic variation may have become embodied into a vessel during its formation.

I begin by examining different theories of style, especially the active and passive theories developed in the 1970s and 1980s. Next, I look at how technological style and practice theory can help bridge the active/passive divide and at ethnoarchaeological studies that have been used to study how different forms of material style are related to different social processes and practices. Finally, I review some recent archaeological applications and explain how these theoretical perspectives on style inform my own work in studying social identity among the Mountain Fork Caddo.

Active vs. Passive Theories of Style

In the middle of the twentieth century, archaeologists primarily used decorative pottery styles as one means of identifying ceramic types, which were then used to study spatial-temporal frameworks within and between culture areas (Krieger 1946; Newell and Krieger 1949). During that era of culture-history studies, archaeologists were largely concerned with using pottery styles to identify processes of diffusion and migration, which were the main proposed causes of cultural change.

After the Ford-Spaulding debates over the appropriate construction and use of ceramic typologies (Ford 1954; Spaulding 1953, 1954); some began to question the utility of style for studying anthropological processes, stating that style and function belonged to different realms of analysis (Binford 1962; Dunnell 1978). A number of archaeologists (Deetz 1965; Hill 1968; Longacre 1968, 1970; Whallon 1968, 1969) specifically linked pottery styles to human activity, however, particularly to behavior related to the social organization of small-scale societies. These ceramic sociology studies were criticized for various reasons (Plog 1978, 1983), but they made a valuable contribution to archaeology by pointing out the potential utility of style in studying social processes.

The ceramic sociology studies mainly regarded style as a quality that was passively imbued in artifacts within traditional household learning communities. Wobst (1977), on the other hand, believed that style served an adaptive function and was used to actively communicate messages. This became known as information exchange theory. Hodder (1977) also saw an active role for style. He thought that style was used to actively convey political and social identity. Hodder (1990) also noted that style could be symbolic and dynamic. Because style was contextual, and contexts often changed because of historical occurrences, symbolic styles could acquire multiple meanings over time. Further, because an individual expression of symbolic style referred to a broader associative stylistic corpus, style could be used strategically by different parties in various ways. For example, it could be used to legitimize power.

In contrast to Wobst and Hodder, who derived their ideas on style during the course of ethnographic fieldwork, Sackett (1982, 1985, 1986, 1990) came up with his ideas about style while studying archaeological lithic assemblages. Sackett coined the term isochrestic style, which referred to the choice among viable alternatives during the production process, which was informed by one's original learning environment. Sackett believed that isochrestic variation could potentially reside within any type of formal variation. He broke down the divide between function and style, stating that functional attributes could also be stylistic, while stylistic attributes could serve a function. Isochrestic variation referred to a more passive process of enculturation within a particular ethnic community, which shaped the artisan's perception of his or her choices.

Sackett conducted a series of exchanges with Wiessner (1983, 1984, 1985, 1990), who adhered to the active school of style. Wiessner conducted her work among !Kung communities in the Kalahari, studying stone projectile points. Her research strategy informed her theoretical perspective on style, and vice versa. She asked her informants which attributes of the projectile points were most meaningful to them, thus automatically eliciting responses regarding stylistic attributes that were conceived of and used for active identity signification. She stated that material style involved the active communication by non-verbal means of personal and social identity.

One benefit of the Sackett-Wiessner debate was that it pointed out that several different definitions of style existed. To a large extent these parties were talking past each other. Part of the issue may have been the different types of research that informed these definitions; on the one hand ethnographic research of living people and on the other hand archaeological research of a static record. A number of archaeologists (Conkey 1990; Hegmon 1992; Kintigh 1985) noted that the active and passive perspectives on style need not be exclusive, and could both be profitably considered.

An alternate approach was taken by archaeologists (Braun 1990; Hill 1985; Schiffer and Skibo 1997) who were attempting to develop evolutionary and behavioral theories.

These studies were notable for maintaining Sackett's reunification of style and function, though some were lacking in certain respects. Braun (1990) believed that processes related to style should be broadly cross-cultural and thus all subject to similar evolutionary processes, negating the role of historical contingency. Schiffer and Skibo (1997) made an interesting use of the *chaîne opératoire* approach to identify different choices that the artisan made during the production process of ceramic vessels, taking a life-history approach. However, because of their focus on selection they over-privileged intentionality at the expense of understanding the less purposeful formation of patterned material variation. It would take the concepts of technological style and practice theory to effectively bridge the gap between active and passive perspectives on style.

Bridging the Divide: Technological Style and Practice Theory

In 1995, Carr wrote an important article criticizing archaeologists who assumed that particular social processes could account for *all* forms of stylistic variation. He stated that the question should be *which* social processes account for *which* forms of patterned material variation. In order to learn more about that relationship between patterned material variation and its potential behavioral causes, he called for the development of more middle-range theories through ethnoarchaeological research (although he noted that some archaeologists had already taken steps in this direction, including Wobst [1977] and Friedrich [1970]). In order to link stylistic material variation to behavior, he suggested a number of goals for ethnoarchaeological research: 1) expand the range of formal variation considered, 2) expand the range of behaviors considered), 3) recognize the hierarchical structure of stylistic attributes, 4) pay attention to the technological process, and 5) look at style across multiple media. He proposed the development of a unified theory of style to account for the many forms of patterned material variation and the processes that could account for them.

Others took some of Carr's ideas to heart while integrating additional schools of thought. Stark (1998, 1999) discussed how the French *technologie et culture* school and the Americanist school of technological style and stylistic studies of everyday goods could be usefully brought together. The French school focused on the integral relationship between society and culture and the patterns of material production and use. Its theoreticians drew on Mauss (1936), who came up with the concept of *techniques du corps* (techniques of the body) to describe how culture influenced various daily practices that were embodied by patterned ways by individuals in particular cultures. This idea influenced Leroi-Gourhan (1993), who developed the idea of the *chaîne opératoire*, or culturally-influenced sequence of artifact production and use (elaborated by Schlanger [1995]). Lemmonier (1993) especially emphasized the idea that technological practice was always embedded within social and economic systems.

Within the Americanist school, Lechtman (1977) came up with the idea of technological style, which was elaborated by Childs (1991). This idea dovetails with Lemmonier's work. Considering technological style, Stark (1998) noted that Sackett (1982, 1985, 1986, 1990) was very important for his focus on stylistic variation among every day, common items, not just those that were highly decorative and carried symbolic content. The impact of all of this research was to a) point out the essential relationship between technological processes of production and social systems, b) to illuminate the social influences on different points in the production process, and c) to show that patterned material variation was present in technological and functional attributes, not just decorative (potentially symbolic and communicative) attributes.

Practice theory became the major means by which different forms of stylistic variation could be understood to coexist within a broader social framework. Stark (1999, 2006) drew on practice theory in some of her ethnographic and archaeological work, but the main introduction of practice theory to archaeological ceramicists was by Dietler and Herbich (1998). These two drew on Bourdieu (1977) to examine the recursive relationship between structure and agency as negotiated by daily practice and the development of habitus. They stated that we must consider artisans as social actors, who were situated within a particular social milieu and acted out their lives within that setting. In the production of ceramics (or other forms of material culture), the choices they made were to some extent relatively unintentional tendencies, conditioned by the structure in which they learned their craft. At other times, however, they made more purposeful production choices, in what some call the exercise of agency. These tendencies relate to the passive creation of isochrestic variation, whereas purposeful choices relate more to the active creation of iconological variation.

Whereas Dietler and Herbich (1998) focused mainly on Bourdieu (1977), Hegmon and Kulow (2005) drew on Giddens' (1984) concept of structuration to discuss processes by which stylistic change occurred among ceramic assemblages in the Southwest. Both of these approaches are very useful for explaining how passive and active forms of style can co-exist. The idea of a "chain of consciousness" put forth by Comaroff and Comaroff (1991) could also be useful in explaining how tendencies and purposeful choices are not divided into a strict dichotomy, but sometimes blend into one another.

Often our daily practices, including those involved in pottery production, are a complex blend of conscious and less conscious actions.

Cognitive anthropology is another significant body of work that is helpful for understanding the relationship between culturally-shaped, shared mental structures and pottery formation. Anthropologists using cognitive theory focus on the role of mental schema and cultural models for understanding the shared ways that people view and interact with the world in different situations (D'Andrade 1995; Dressler 2005). In her study of late Missisippian communities along the Alabama River, Regnier (2006) used cognitive anthropology as a model for interpreting ceramic attribute clusters as representative of groups of potters who shared similar mental models of ceramic production. These shared mental models arose from interactions within similar learning environments, leading Regnier to interpret the co-existence of multiple attribute clusters within a single town as evidence for a multi-ethnic community comprising potters from multiple learning localities.

Linking Material Style and Process: Ethnoarchaeological Studies

Technological style, practice theory, and cognitive anthropology provide us with a helpful theoretical framework for approaching ceramic studies. In order to use this framework to infer how the different aspects of style that we see in the archaeological record are related to various behaviors, we need to turn to ethnoarchaeology for analogies and middle-range theories (keeping in mind that these need to be applied very carefully). Here I review several notable ethnoarchaeological studies that may help us to link pottery style with social processes. These studies illustrate a range of stylistic correlates to both embodied tendencies and active signification, although sometimes these processes are difficult to separately delineate, even ethnographically.

This suggests that the lessons from these studies should be applied cautiously when interpreting the archaeological record.

Herbich (1987) conducted research among the Luo of Kenya. She found that villages could be characterized by different ceramic micro-styles that included a suite of attributes, including those related to formation and decoration. These micro-styles were maintained by the female potters in the villages, who had moved to the villages after they were married in a patrilocal post-marital residence system. These communities placed a strong emphasis on post-marital re-socialization, which included re-learning the appropriate ways of making pottery. Here the maintenance of style was related first to active identity maintenance, through re-learning the culturally-correct way of pottery production, and second to the more passive maintenance of those methods as the women incorporated them into their habitual routines. Although Herbich's work challenged the ceramic sociology studies that used style to study social organization, it showed promising avenues towards the archaeological identification of social communities, which was one of my goals for the Mountain Fork Caddo.

Longacre and Stark (1992) were two leaders of a long-term ethnoarchaeological study among the Kalinga in the Phillipines. They found that distinct multi-attribute ceramic styles, which again included attributes related to both formation and decoration, could be distinguished between groups of villages that had different social and political alliances. Stark and colleagues (2000) continued this work, finding that paste composition correlated to those other stylistic clusters of attributes. They noted that significant differences existed between villages that were only 2 km away from each other, but were allied politically to separate broader groups of communities. Processes related to enculturation and identity signification may both have played a role in the creation and maintenance of these multi-attribute styles, although the researchers did not delineate where one process ended and the next began.

Whereas these researchers found concordance between different stylistic attributes in relation to community identity, Gosselain (1998, 2000) discovered distinctions between different ceramic attributes and social processes in his work in Cameroon. He traced female potters, who sometimes moved away from their home communities, although seldom more than 50 km away. These women usually learned how to make ceramics from female relatives while they were growing up and were not subject to extensive re-socialization if they moved away.

Gosselain (1998, 2000) found that different production behaviors were more resistant to change over time than others. This variability was related to a) the visibility of both the behavior and the resulting attributes and b) the malleability of the behavior. Attributes related to fashioning the vessel were the most resistant to change. These attributes were not very visible on the finished product, and fashioning behaviors were usually done at home, where the pottery was not subject to any social observation of critique by the rest of the community. (Things might be different if pottery was manufactured in a group setting.) Fashioning behaviors were also embodied by individuals as techniques *du corps*, and so were less likely to change much over time without conscious effort. Decoration, on the other hand, was the attribute least resistant (most likely) to change. Decoration was highly visible on the finished product and so any social significance it carried was immediately noticeable and subject to comment by other members of the community. The practice of decorating a vessel was also less related to embodied technological performance and so was more malleable. Behaviors related to paste composition and firing fell somewhere in between fashioning and decoration in terms of their resistance to change. Sometimes these behaviors were carried out in group contexts where some pressure might exist for social conformity, but at the same time the related attributes would not necessarily be visible on the finished vessel.

Bowser (2000) conducted an ethnoarchaeological study among groups in the Amazon, which of all the ethnoarchaeological studies is likely the most pertinent to this analysis of Caddo pottery. Unlike the other studies discussed herein, she focused solely on decoration, which is unfortunate as we could have learned more had she studied a suite of attributes. However, her results are important. She found that decoration varied significantly between households within a village and that it was intentionally used by the female potters to signify political alliances, or ambiguity of alliance in some cases. Decorative motifs did not statistically correlate to household or village of origin, where the women learned to make pottery, but were actively manipulated by adult women in their own households. Basically, the women used decoration to actively signify political alliance. This was another goal for my project: to identify inter-site and inter-regional alliances or other social connections for the Mountain Fork Caddo communities. Decoration looks like a promising means for doing so.

Based on her work, Bowser argued that in middle-range unspecialized societies the political and domestic spheres intermingled, because both men and women visited one another's houses to discuss social and political issues. Although the men were technically the public political face of the household, Bowser found that women had a great deal of influence behind the scenes, both within their own household and in terms of their influence over other women in the village. Because of this integration of public and domestic spheres, Bowser suggested that we should pay attention to the decoration of utility wares as well as to more public or ceremonial vessels when studying how ceramic decoration might signify political identity in middle-range societies. Interestingly, she noted that decorative motifs cross-cut two nearby villages in which different households held different political alliances.

Although in historic Caddo communities men held the public political and religious leadership positions, Barr (2007:60-62) and Sabo (1998) have pointed out that women were integral to maintaining economic stability through food production and maintenance of the matrilineage. It is likely that Caddo women, like the Amazonian women in Bowser's (2008) study, were also politically influential and may have signaled their affiliation through pottery decoration. Although this might be most likely on finely decorated serving vessels, utility vessels used to cook and transport food to gatherings might also have been media for the communication of political identity.

Archaeological Applications

There are a number of lessons here for the archaeological examination of social processes through ceramic styles. First, if we want to identify social communities of potters who learn their craft from one another, attributes related to fashioning processes appear most accurate. These may include formation method (coiling, pinching, etc.), the shape and proportionality of the vessel, wall and rim thickness, rim profile, and lip shape. Based on Gosselain's (1998, 2000) research, it appears that the behaviors producing these attributes are the most resistant to change over time. Further, Herbich's (1987) work suggests that if an individual's fashioning behaviors do change, it is most likely because of re-socialization. Although it may be difficult to infer the type of social organization from ceramic attributes as the ceramic sociology studies attempted to do, we should be able to identify communities of learning, which in middle-range unspecialized societies probably correspond to households, extended kin-groups, or villages. Shared learning implies a community of practice. So, archaeologically, if we find significant differences in fashioning attributes between domestic sites, it would seem to imply that those sites were occupied by different learning communities. If fashioning attributes are extremely similar between contemporary sites, it implies some sort of close social connections, such as marriage exchange, between communities who maintained similar pottery fashioning traditions.

The ethnoarchaeological studies strongly suggest that decoration is most closely related to social, political, or religious signification of identity, whether implicit or explicit. As Gosselain (1998, 2000) noted, decoration is highly visible and relatively malleable over time, in comparison to more ingrained motor habits related to fashioning. Decorative style is an effective measure of social identity because it is easy to change within one's lifetime as interests or allegiances change. Some decorative motifs may be symbolic or may hold more formal iconographic content, and so are inherently useful for signification of politics or ideology. For Caddo pottery these motifs probably include the scrolls, half-circles, and blank circles that cross-cut different types of fine wares and are present throughout the area. Some of the types related to these wares are particularly widespread and useful to interpret chronology as well as the reach of religious or political ideologies.

Other decorative styles are likely more closely related to the signification of regional and local identities related to alliance or other forms of social connection (or distance). For the Caddo area, these include designs that are limited to particular vessel types and local designs that only occur within particular regions or valleys. It is difficult to know how much of this type of stylistic variation is a result of purposeful signification of identity and how much is related to less conscious adherence to community traditions. Either way these regional styles imply social connections between particular communities, whether those connections are related to local gatherings of related kin-groups, trade, or the signification of local political boundaries or alliances.

Two recent archaeological ceramic studies that use both attributes related to fashioning and those related to decoration to study social boundaries and social connectedness are those of Chilton (1998) and Parkinson (2006). Chilton compared the distribution of attributes between individual artifacts to study social boundaries between Iroquoian and Algonquian groups in the Northeast. She paid careful attention to patterns of attribute distributions, in order to understand potentially different social processes at work within communities. Parkinson also conducted a multi-attribute stylistic ceramic analysis to study processes of boundary maintenance in Copper-Age Europe. He looked at both attribute visibility and at the pattern of attribute distribution (whether it was gradual, modal, or random). He considered both of these at a series of different geographic scales to propose different broadly regional social processes that might have been at work over time.

Closer to home, Blitz and Lorenz (2006) used decorated pottery types to study social integration in the lower Chattahoochee Valley in the southeastern United States during the Mississippian period. They focused particularly on decorated types of utilitarian pottery, using these types to identify ceramic style zones and to measure social integration over time and space (Blitz and Lorenz 2006:23). They found that individual attributes related to formation processes and even individual decorative attributes were not helpful for identifying zones of pottery similarity. The overall decorative configurations (in conjunction with paste composition for these Mississippian types) were the most useful markers of social identity for archaeological study. In contrast, Regnier (2006), working with assemblages from fifteenth-century sites the Alabama River Valley, found that attribute analysis was most effective for analyzing the ethnic composition of Late Mississippian towns and tracing the development of new potting traditions. The difference probably lies in the different scales at which the researchers were working. Whereas Blitz and Lorenz (2006) used pottery as a proxy for identifying multi-community clusters, Regnier (2006) used pottery to analyze intra-community differences in identity.

In sum, among contemporaneous communities ethnoarchaeological studies imply that fashioning techniques should relate most closely to social connections creating shared learning environments, such as intermarriage, between pottery-making communities. Decorative similarities imply a wider range of social connections between communities. Similarities in decorative utility wares and regional decorative elements and configurations may derive from an array of social connections, including local gatherings of kin, trade, or the signification of local alliances. Conversely, differences between contemporary communities may imply the signification of political boundaries. Ideological identity is related to widespread symbolic elements and motifs and is more likely to be expressed on fine wares, such as serving wares used for public occasions.

Archaeological studies have found both individual attributes and polythetic types helpful for identifying different processes related to social identity. I collected data from the Mountain Fork pottery assemblages in order to conduct both modal analyses of attributes to search for small-scale differences between communities and analyses of decorative types to identify potential differences in political identity and regional affiliation. The next chapter explains the methodology for data collection and the history of the type concept in the Caddo area before moving on to present the data analysis.

Chapter 5: Mountain Fork Pottery Assemblages

This chapter begins with a description of the methodology used to collect data from the six major Mountain Fork pottery assemblages. Don Wyckoff (personal communication 2006) jokes that Caddo sherds can be classified into three categories: “big ones, little ones, and red ones.” The approach taken here involved recording a suite of attributes and variables for each sherd and vessel. Next, I discuss the various approaches to pottery typologies in the Caddo area and the reasoning behind my approach, which is to focus primarily on decorative types. The rest of the chapter describes the overall character of the assemblages, comparing paste, surface treatment, decoration, vessel form, and vessel size across the sites in order to identify potentially meaningful patterned variation that may be indicative of chronology, social identity, regional affiliation, and activities conducted at the different sites.

All vessels, vessel fragments, and sherds were analyzed from each of the six sites. The vessels from Beaver (n=24) and E. Johnson (n=18) were recorded in a previous project (Dowd 2011c). In sum, 16,811 objects were recorded, including 43 whole or partial vessels, 11,819 sherds, and 4,949 sherdlets (Tables 5.1 and 5.2). I recorded all of the pottery myself in order to maintain consistency of observation and avoid the error that could be introduced by multiple analysts.

Table 5.1. Count of pottery recorded from the Mountain Fork sites.

Site no.	Site name	Number of sherds	Number of sherdlets	Number of vessels	Total number of objects
34Mc1030	Ramos Creek	644	n/a	0	644
34Mc104	Woods Mound Group	1643	570	0	2213
34Mc21	Hughes	460	115	0	575
34Mc54	E. Johnson	3441	2040	18	5499
34Mc1	Beaver	4565	2037	24	6626
34Mc105	Biggham Creek	1066	187	1	1254
	Total	11819	4949	43	16811

Table 5.2. Weight of pottery recorded from the Mountain Fork sites.

Site no.	Site name	Weight of sherds (g)	Weight of sherdlets (g)	Estimated weight of vessels (800g/ vessel)	Estimated total weight (g)
34Mc1030	Ramos Creek	2900	0	0	2900
34Mc104	Woods Mound Group	14868	717	0	15585
34Mc21	Hughes	3854	151	0	4004
34Mc54	E. Johnson	24757	2546	14400	41703
34Mc1	Beaver	26864	2575	19200	48639
34Mc105	Biggham Creek	8950	227	800	9977
	Total	82193	6216	34400	122808

Methodology

Analysis of sherds began by sorting them through a ½” screen to separate the pottery by size. Any sherds smaller than ½” were labeled as sherdlets, counted, weighed, and then set aside. Every remaining sherd was analyzed individually. An exception was made for the Ramos Creek assemblage. Because the number of sherds recovered here was small to begin with, each sherd, even those smaller than ½”, was analyzed individually in order to recover as much data as possible. The approximate diameter of each sherd was recorded to the nearest centimeter using a series of graded circles with diameters in one centimeter increments. If 95 percent of the sherd fit with a circle, it was assigned the diameter of that circle. Each sherd was then weighed on a digital scale to the nearest tenth of a gram. Each whole vessel was assigned a proxy weight of 800 grams per vessel for the purpose of this analysis. This was the approximate weight of one vessel of average size. The same proxy weight was assigned to all vessels because each vessel (or partial vessel) is here considered a single complete unit of decorative intent. By using a single weight value, no vessel is given more weight than another due to its size when comparing the incidence of a particular decorative configuration. Thickness of sherds and vessels was measured with digital calipers to the nearest tenth of a millimeter. When measuring thickness, decorative elements were avoided. For rim sherds, the measurement was taken approximately one centimeter under the lip.

The most prevalent temper present in the sherd was recorded. For this study I am defining temper as any inclusions within the clay. Some of these inclusions, such as crushed shell or grog particles, were obviously intentionally added, but others, such as sand, may have been present in the original clay source. Differentiating between natural and intentional inclusions can be difficult without samples of local clays and is outside the scope of this project. For a thorough discussion of this issue see Rice (1987:406-413).

For each main temper category the size and abundance of the temper particles were described (Figure 5.1). Temper particles were assigned a size of fine, medium, or coarse and abundance was described on a scale of 1 (few particles) to 4 (many particles). Although this measurement is subjective, it was relatively uniform because I analyzed all of the sherds myself. Major temper categories included grog, shell, sand, and grit. Grog is defined here as crushed particles of baked clay, often from old pottery. Sand was distinguished from grit by the roundness and consistent size of the particles, although sometimes it was difficult to tell the difference between these two categories. Minor temper categories included bone, limestone, and charcoal.

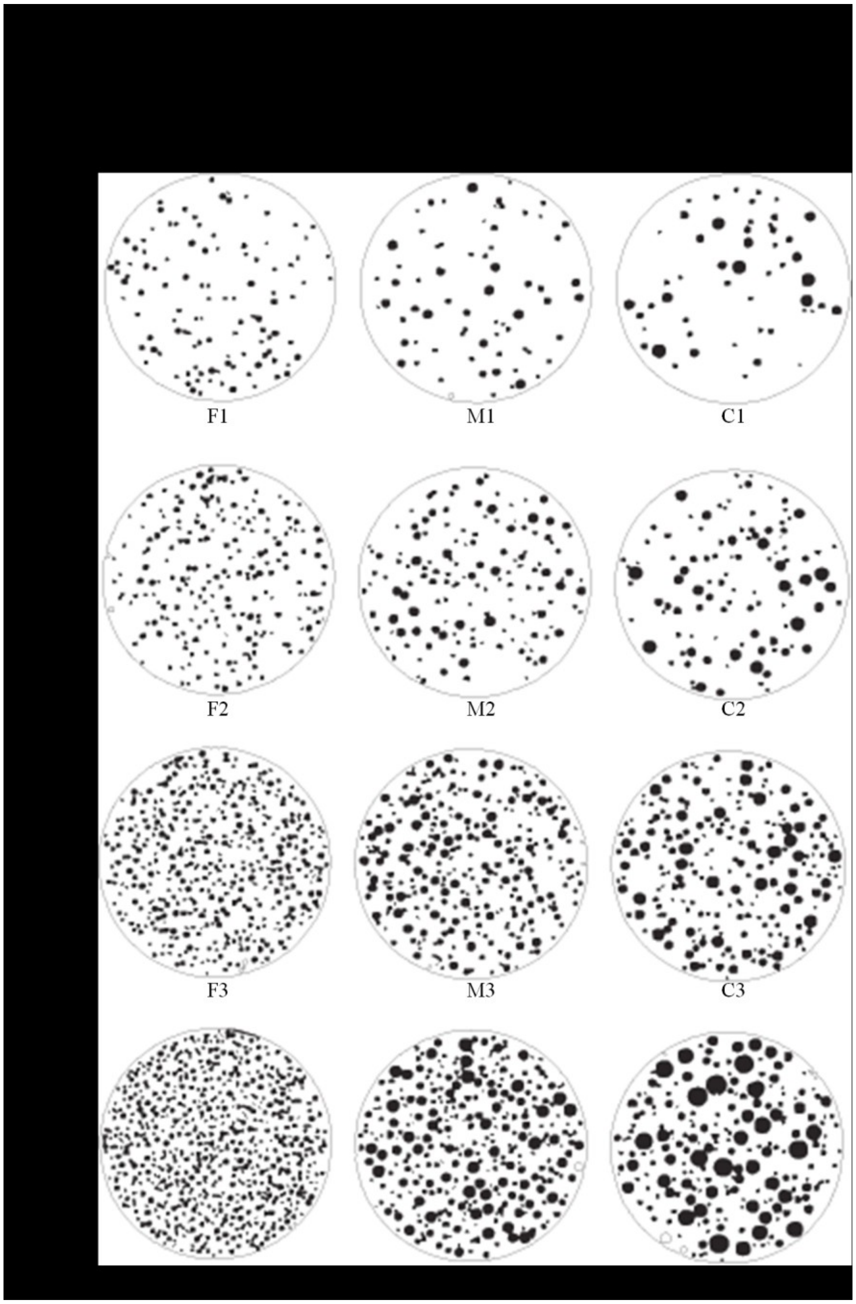


Figure 5.1. Chart used to describe size and abundance of inclusions (after Orton et al. 1993:Figure A.4 and Mathew et al. 1991).

Surface treatment was recorded for every sherd as plain, smoothed, burnished, red slipped, or decorated. More than one state was recorded when appropriate; for example, a sherd might be both red slipped and decorated through engraving.

Additional treatment was given to each sherd with diagnostic attributes that revealed anything about vessel form or decorative intent. Rim, neck, shoulder, and base sherds can be diagnostic of vessel form. Rim sherds can be particularly important for identifying approximate vessel size and also incorporate other attributes related to formation techniques. For each rim sherd, a number of attributes related to rim and lip characteristics were recorded. These included the rim profile, curvature, form, and treatment, and the lip shape and decoration. Most attributes were defined according to Brown's (1996:331-339) work in the Arkansas River Valley.

The rim profile may be either everted (leaning outward), standing (straight up and down), or inverted (leaning in). Rim curvature may be excurvate, straight (no curvature), or incurvate. Rim form indicates changes in thickness along the rim profile and may be direct (no change), thinned, expanding, rolled, collared, or interior collared. The overall treatment or shape of the entire circumference of the rim may be either round, scalloped, or castellated with four evenly-spaced rim peaks. Certain vessels in the Caddo area also have two tabs protruding from either side of the rim. Lip shape may be either rounded or flat, angled in or out (or not angled), and sometimes grooved. The lip may also be decorated with a series of parallel tick marks (indentations), usually at an oblique angle.

When sufficient information was available the overall vessel form was recorded. Rim shape, the presence of a neck or shoulder, and certain types of decoration are all useful for determining vessel form. An earlier project documenting vessels accompanying burials at the Beaver and E. Johnson sites (Dowd 2011c), and numerous other reports on whole vessels in the Caddo area provided information on the range of vessel forms that might be expected at the Mountain Fork sites. Significantly, vessels accompanying burials were evidently used during life, as well, based on the presence of cooking residue on some. They also vary greatly in quality and style, suggesting that they probably represent a full range of vessel types and that the burial context does not bias the sample towards a particular set of vessels.

Vessel forms include jars, various forms of bowls, bottles, and, rarely, compound vessels. Jars are vessels with a mildly restricted orifice, meaning that the neck diameter is smaller than the orifice diameter. In the Caddo area, the shape of jar bodies range from squat and bulbous to more elongated forms, but all share a series of common decorative schemes. Most jars are neck-banded, with one or more rows of ridge-pinching or punctation encircling the zone between the lip and the constricted neck (Figures 5.2 and 5.3, Suhm and Jelks 1962:111).[2] Ridge-pinched neck banding is almost entirely unique to jars. It is likely that jars were over-recorded in relation to other vessel forms in all of the assemblages because of this highly recognizable diagnostic characteristic. Jars are generally considered utility cooking and storage vessels across the Southeast (Hally 1986) and in the Caddo area are often decorated with less precision than bottles and bowls. Jars always have everted rims that are often excurvate and sometimes straight. They rarely have decorated lips.

[2] Not all researchers in the Caddo area agree on the definition of “neck banding”. Suhm and Jelks (1962:111) originally described it in relation to Nash Neck Banded vessels: “The type is recognized chiefly by rather careful, regular crimping of the rim coils, giving a corrugated effect or “neck banding” … A simulation is sometimes produced with vertically-placed fingernail punctations in unsmoothed neck coils.” I maintain that neck banding was part of a broader idea about the appropriate treatment for the rim of a jar that involved covering it with linear bands of some sort, through combinations of crimping or ridge-pinching unsmoothed coils and creating rows of punctation. The techniques were stylistic variations on a single theme and form a continuum of neck-banded appearances.

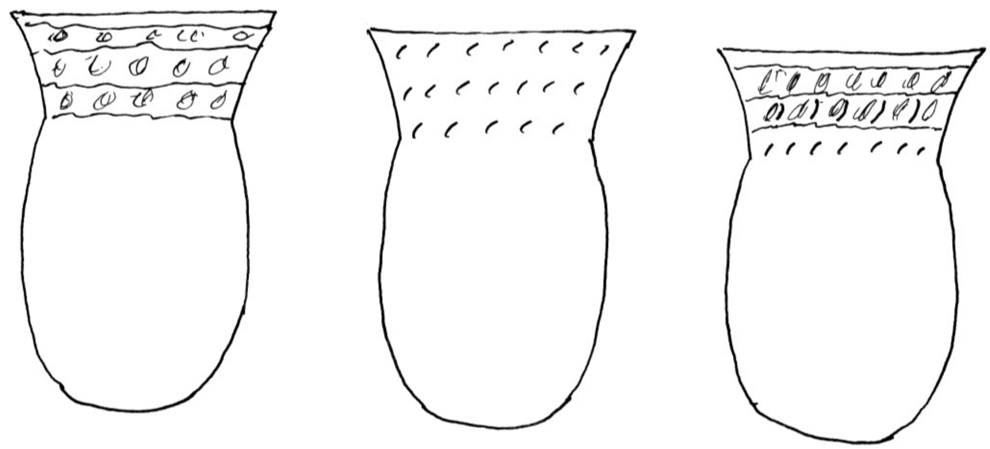


Figure 5.2. Modes of neck-banding: ridge-pinched, punctate, and combination.

Figure 5.3. Illustration of decorative variation on jar rims from sites along the Mountain Fork.

Bowls are usually non-restricted vessels that are often relatively shallow, but in some cases are deep. Different types are distinguished by the number of inflection points along the vessel profile. Simple bowls have no inflection points. Shallow simple bowls often have a slightly incurvate profile, ending in a standing or inverted rim. Deeper simple bowls more often have an everted and excurvate rim and are often red slipped and engraved. These deep red slipped simple bowls are more common at sites along the western Little River and Red River and in northeast Texas than at sites along the Mountain Fork. Simple bowls were most likely used for both storage and serving.

Carinated bowls have one inflection point, with straight rims that are either standing or inverted. Sometimes the panel between the point of inflection and the lip is decorated, seen for example on Sanders Engraved vessels. Complex carinated bowls[3] have two inflection points, creating a distinct shoulder and inverted panel followed by a neck and standing or everted rim. Like jars, these vessels are restricted, although unlike jars they have two rim panels and almost always have a greater orifice diameter than height. The neck restriction of both jars and complex carinated bowls may have reduced spillage when carrying or serving liquids. The inverted panels of complex carinated bowls vary in height from the taller panels seen in Friendship Engraved vessels to the shorter panels of Simms Engraved and Cook Engraved vessels. As these type names indicate, often the panel between the shoulder and neck is finely engraved. Lip decoration occurs most frequently on these vessels. They were likely used for serving purposes. Both carinated and complex carinated bowls may have either straight or incurvate bodies.

[3] In Dowd 2011, I referred to complex carinated bowls as "compound bowls". I have switched to the more standard usage here.

Bottles have very restricted orifices and extended necks. They are almost always burnished or finely engraved (or both). Neck shape is chronologically sensitive and necks may be cylindrical, tapered, or spool-shaped with bulging mid-sections. Finally, a limited number of vessels have compound forms that stack one vessel form on top of another.

With some rim sherds orifice diameter could be determined using a curvature diagram. Orifice diameter was approximated for all rim sherds with three or more percent of the orifice present. The measurement was subject to less error when five or more percent of the orifice was present. For neck sherds, when five or more percent of the neck was present, neck diameter was recorded. This measurement provided a minimum orifice diameter for those vessels.

For every decorated sherd or vessel a number of attributes were recorded, including decorative technique, the basic decorative elements and patterns used, the location of the decoration, and when possible, the overall decorative type and variety. Each sherd with more than a single line of decoration was also drawn on a card so that the designs could be easily compared across the assemblages.

The Caddo used four major techniques to decorate their pottery: inscribing (a word used here to encompass several forms of drawn decoration, including incising and engraving), punctation, appliqué, and ridge-pinching. When inscribing a vessel a tool was drawn through or across the clay to create linear designs. Inscribed techniques included engraving, incising, and trailing. Incised and trailed lines were drawn through wet or leather-hard clay, leaving lines with some depth. The line between incised and trailed lines is not entirely clear, but generally trailed lines were created with a broader tool, leaving a line more than 0.8 cm in width. Engraved lines were drawn through clay that had been dried to a leather-hard stage or fired. Engraving often created a color contrast between the exterior of the vessel, which was also frequently burnished and shiny, and the interior. The exterior surface changed color during the firing process depending on how much oxygen was available. If oxygen was abundant, then the iron compounds in the clay particles on the exterior of the vessel might oxidize and turn the vessel a red, brown, or orange-ish color. If the pottery vessel was smothered during firing, however, then the particles would undergo reduction and turn black or very dark brown. In either case, the clay underneath usually stayed a shade of tan or gray. When the vessel was engraved the tan-gray clay was revealed creating a sometimes striking contrast. Generally utility vessels were more often incised or trailed whereas fine wares such as bottles were engraved. Sometimes, though, especially post-1500, trailing was used on fine wares to create full fields of interlocking scrolls and spirals. Even on utility vessels such as jars, though, incised decorations were sometimes very finely drawn, and occasionally so-called utility vessels were burnished and engraved, eroding the distinction between utility and fine wares.

Punctation involved using a fingernail or tool to press into the wet or leather hard clay and leave an impression. Punctation techniques included fingernail punctate, fingernail impressed, tool punctate, and reed punctate. Fingernail punctate is here defined as a simple mark left by the tip of a fingernail in the clay. Fingernail impressed refers here to the mark left by a fingernail that has been pressed into the clay and then dragged slightly, which pulls the clay up slightly over the adjoining surface. In the Caddo literature these have been commonly combined, but for this analysis it seemed appropriate to distinguish between the two techniques, at least initially, to see if any patterns emerged between where and when they were used. Tool punctate refers to the use of a wooden or bone tool, possibly shaped, to leave a mark in the clay. Occasionally it is possible to trace the use of a distinct tool. Reed punctate refers to the use of a specific tool, a hollow reed, to leave a circular mark. Punctation was most commonly used on utility vessels, including neck-banding on jars as mentioned earlier. Sometimes it was used linearly to create bands or other linear shapes, whereas other times it was used as fill between incised lines or for full-field decoration, which is decoration that covered an entire portion of a vessel, such as its body.

Ridge-pinching was mentioned earlier in relation to neck-banded jars. It involved pinching the wet clay to create rows of molded marks of impressions and ridges, creating a roughened surface. This could have been useful for keeping a grip on the jar, but could have also been merely decorative, especially when rows of light fingernail punctate took the place of ridge-pinching.

Appliqué decorations were either gently molded from the wet clay of the vessel itself or were separately molded and then attached to the vessel. Caddo artists used appliqué nodes, ridges, and various forms of handles to embellish their vessels, most frequently jars. Ridges were primarily used on the bodies of jars, either singly to divide the body into a series of four decorative panels, in sets of nested v shapes, and sometimes in more complicated patterns. Nodes (single round molded applications), often vertically-stacked sets, were sometimes used similarly to ridges on the bodies of jars to delineate decorative panels. Other times they were clustered together on the vessel body or placed singly on the rim where a handle might otherwise go. Nodes were usually round, but sometimes square, oblong, or paired to create a double node. Handles included loop handles, wider strap handles, and decorative pseudo-handles with no actual hole between the handle and rim. Both strap and pseudo-handles in the

Mountain Fork assemblages were often further embellished with small, parallel vertical ridges on them.

After noting the decorative technique or techniques present on a sherd, the basic elements and patterns made with each technique were recorded (Tables 5.3, 5.4, and 5.5). Sometimes only simple elements, such as a meandering line or set of parallel diagonal lines, could be recognized. More complex patterns could occasionally be identified on either larger sherds or those with denser sets of interacting elements. Distinct elements and patterns are technique specific and were separately recorded for each major technique. Decorative configurations, however, may involve combinations of these elements and patterns from different techniques. Configurations describe the overall decorative intent of the artists. For example, one common Caddo decorative configuration consisted of a series of interlocking engraved scrolls symmetrically arranged around the body of a bottle and filled with hatched lines. Another common configuration was composed of a four appliqué ridges symmetrically arranged around the body of a jar, delineating fields filled with a pattern of incised perpendicular lines in the shape of an X filled with nested Vs.

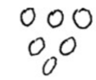
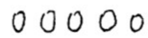
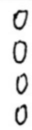
Table 5.3. Inscribed elements and patterns.

Single straight line		Perpendicular lines and nested Vs		Scroll	
Dashed line		Intersecting lines		Horizontal and curved lines	
Multiple horizontal lines		Radiating lines		Hatching (no discernable boundary)	
Multiple vertical lines		Herringbone		Closed element, no embellishment	
Multiple diagonal lines		Diagonal lines split by vertical line		Closed element, embellished	
Single or repeating V(s)	V VV	Nested gulls		Band, diagonal hatching	
Nested Vs		Single curved line		Band, cross-hatching	
Matched nested Vs		Multiple curved lines		Band, transverse hatching	
Perpendicular lines (a)		Meandering line		Band with negative element	
Perpendicular lines (b)		Multiple meandering lines		Line embellished with tick marks	
Perpendicular lines (c)		Meandering line with perpendicular lines		Line embellished with triangular marks	

Table 5.4. Punctate elements and patterns

Single		Linear vertical		Full-field vertical	
Linear horizontal, punctations oriented horizontally		Linear intersecting		Full-field horizontal	
Linear horizontal, punctations oriented diagonally to vertically		Linear arc		Constrained	

Table 5.5. Appliqué elements and patterns.

Single		Group		Arc with vertical fill	
Repeating horizontal		Nested Vs or coalescing		Gull with vertical fill	
Stacked vertical					

Types and Other Classificatory Systems in the Caddo Area

When archaeologists develop pottery typologies and other classificatory schemes, one common goal is to create a proxy for studying social identity through identifying representative sets of shared culturally-significant behaviors, namely pottery types. Archaeologists generally define types as polythetic, or composed of a group of artifacts that are more similar to one another than they are to those in other groups (Steponaitis 1983:48). Although based on formal attributes and visible criteria, the formation of pottery types is always subjective to a degree. It is not possible to reach an emic perspective of how people in the past would have categorized their everyday objects; nor is it likely that all people in a given community would have had categorized and thought about their objects in the same way. Archaeological types are most usefully thought of as devices to help us address particular questions in the archaeological record, and the criteria for type formation should be devised with those questions in mind. Archaeologists working in the Southeast most commonly use pottery types to address cultural affinity, chronological and geographical (Hilgeman 2000), the communicative and non-communicative aspects of social identity (Hilgeman 1991; Kelly 1991; Pauketat and Emerson 1991), and social integration (Blitz and Lorenz 2006; Livingood 2010).

Pottery classification in the Caddo area has a complicated history. Pottery types in the Caddo area were first developed by Krieger (1946), drawing on WPA excavations in the 1930s and 40s and on the work of Webb and Dodd (1941) along the Red River. In 1949, a volume was published by Newell and Krieger, describing and analyzing excavations at the George C. Davis site in eastern Texas. Krieger used the huge number of pottery sherds excavated from G.C. Davis to further develop the Caddo pottery typology. His work was expanded upon and formalized by Suhm and Jelks, who worked with Krieger to publish descriptions of culture areas and pottery and point types in Texas in a 1954 monograph, informally referred to as the Texas Handbook. This volume, republished in 1962, was complemented by Webb's (1959) work at the Belcher Mound along the Red River in Louisiana.

Suhm and Jelks (1954), in their introduction to the Texas Handbook, strongly encouraged archaeologists to modify the types over time, even publishing the volume at one point in loose-leaf binder format to encourage additions. Their original data was fairly extensive, but understandably new excavations in uninvestigated regions would necessitate change. Individual archaeologists did indeed create new types and split old types into numerous varieties over the years, paying close attention to regional distributions (i.e. Brown 1996; Early 1993; Schambach and Miller 1984; Skinner et al. 1969; Wyckoff 1968). Political boundaries, the fast pace of contract work, and the necessity of quick publication, however, have lead to less cohesion and comparison of types and varieties across the Caddo area than might be desirable.

During a project studying whole vessels in southeastern Oklahoma (Dowd 2011c) I discussed the reification of the Texas types and their potentially stultifying effect on identifying small-scale variation within and between drainages. At the time I did not fully appreciate the work that other archaeologists have put into addressing these issues and the time required to absorb the extent literature describing new types, varieties, and concurrent classificatory systems.

In the coming years I am sure that archaeologists of the Caddo area would benefit from sitting down together and attempting to at least develop a comprehensive and contemporary description of pottery variability. It has now been 48 years since this was last attempted; perhaps a 50th anniversary book is in order. This is particularly important because archaeologists in the Caddo area do not always use the extant types similarly; nor, necessarily, should they. Different questions, research strategies, and scales of study necessitate different criteria for type formation, and on some issues we may simply not agree. However, a volume describing our different philosophies toward classification and our different classificatory schemes would be helpful for both new researchers and practicing professionals in the area. Additionally, some of the Caddo people would like to become more involved in creating type names in order to address one aspect of lasting colonial influences in Caddo archaeology (Redcorn 2011, personal communication). A new volume on pan-Caddo area pottery classification would be an excellent opportunity to work together on this issue.

In the Southeast, the most historically significant pottery studies are Phillips, Ford, and Griffins' (1951) major survey report on the Lower Mississippi Valley, Phillips' (1970) seminal work on the Yazoo Basin, and Steponaitis' (1983) work with pottery from Moundville in the Black Warrior Valley. Phillips (1970:24-28) standardized Mississippian type definitions are based on three main attributes: paste composition, surface finish, and decorative techniques. The system is hierarchical, considering paste first, then the other characteristics. Within each type, varieties are distinguished by variations in paste or design characteristics (Steponaitis 1983:50). When no variety can be identified, perhaps because of sherd size, the specimen is labeled by the type name and then simply as variety unspecified; for example, Bell Plain *var. unspecified*.

Phillips' type-variety system was never applied to the Caddo area in the same manner as it is used in the Mississippi Valley, and archaeologists working here do not use a single system for pottery analysis. The type-variety system as it currently stands does not work well in the Caddo area because of its inability to encompass all the data. Most small sherds, especially those with little or no decoration, cannot be accurately typed, for two main reasons. First, in parts of the Caddo area a variety of temper combinations may be present within a single decorative type. Although a number of decorative types tend toward a particular paste composition, many temper combinations exist within sets of vessels that clearly express a uniform decorative intent and spatial-temporal distribution. This is quite different from the situation in other parts of the Southeast, where temper clearly has cultural meaning and coincides with specific decorative types (Phillips 1970:25; Steponaitis 1983:50-51), although even in the Mississippian area archaeologists are increasingly problematizing the relationship between culture and temper and are considering the geographical effects of temper availability on paste composition (Galaty 2008; Livingood 2010).

To summarize, in much of the Caddo area small sherds with little or no decoration cannot be accurately placed within a specific decorative type. For example, a red-slipped body sherd with no tooled decoration may come from a Sanders Plain, Sanders Engraved, Avery Engraved, or Maxey Noded Redware vessel. Although these types tend towards certain paste combinations, numerous variations exist. Assigning a sherd to one of these types is spurious unless one is working in a valley where paste combinations are very restricted and coincide neatly with decorative configurations. This is simply not the case along the Mountain Fork.

The second problem with assigning sherds to types is related to the decorative practices of Caddo potters. Schambach and Miller (1984:113) estimated that only about 21 percent of the sherd assemblage at Cedar Grove could be accurately typed. They stated that this difficulty arose primarily because the potters frequently used different interchangeable techniques and designs on the rims and bodies of their vessels. Vessel A might have a rim incised with horizontal lines and a body with trailed interlocking spirals. Vessel B might have the same rim and a body with a punctate-incised pattern. Vessel C might have the body of B with a ridge-pinched rim. In particular cases a particular rim decoration can be used to predict the body and vice versa. Much of the time, however, the two do not exclusively coincide.

To deal with this difficulty, Schambach (1981) developed a descriptive pottery classification system, which was elaborated by other archaeologists working primarily in Arkansas (Rolingson and Schambach 1981; Schambach and Miller 1984; Weinstein and Kellye 1984; Early 1988, 1993). Suhm and Jelks (1954) emphasized that their types were cultural types based on the known distribution of specific sets of vessels. Schambach and his colleagues saw the need for a concurrent classificatory system that did not emphasize distribution and that could acquire additional information on sherds when no type could be assigned. Using the descriptive system and, when possible, the type system, different levels of information could be simultaneously collected, increasing the research potential of sherd collections. Each sherd was first assigned to a class based primarily on the principal technique, then if possible to a pattern, defined as a particular combination of motifs, and then (again if possible) to a design, defined as a pattern with "specific attribute combinations" (Early 1993:65). This hierarchical system could be easily integrated with the type classification system and could assist in delineating variation within established types and identifying new ones.

This idea of hierarchical levels of data analysis inspired an earlier project where I developed a classification system for a series of pottery vessels from sites in southeastern Oklahoma (Dowd 2011c). Although I drew on the ideas of both hierarchical and concurrent analyses, I did not follow the Arkansas descriptive system precisely. The patterns and designs of the Arkansas descriptive system were developed with a strong knowledge of existing variation among whole vessels from southwest Arkansas. In Oklahoma we did not have a comprehensive understanding of whole-vessel variation; my 2008 project was a step in this direction. The vessels were described hierarchically looking first at vessel forms and fields of design, then overall decorative configurations, then at variations within those configurations. The overall configurations were akin to decorative types, although at the time I did not attempt to directly correlate the configurations and types. Nor did I address revising the current named types to better account for variation in southeastern Oklahoma, because it was outside the scope of that project. With the abundance of additional data collected from the Mountain Fork, that issue will be addressed herein.

Alongside classifying vessels by form and decorative intent, my 2008 project also included an analysis of variation in vessel dimensions and a modal analysis of attributes that were not necessarily correlated with decorative type. This is a common strategy for pottery studies in the Southeast (J. Brown 1996, T. Brown 2005, Hilgeman

2000, Phillips 1970, Regnier 2006, Steponaitis 1983). Some of these modal attributes included form-related rim and lip attributes, lip decoration, and rim appliqué.

Overall Character of the Assemblages

For this study, I classified sherds and vessels into types and varieties when possible based almost entirely on decorative configurations. Although certain tempers predominate with some of the types, almost all of the types encompass multiple pastes. These types form coherent groups based on decorative intent. Because of the high proportion of decorated vessels among Caddo pottery assemblages, the sheer variety of different decorative configurations, and the correspondence between decorative configurations and vessels forms, decorative configurations are the most useful means of classifying Caddo pottery into meaningful types. Although Rouse (1960) and others (Regnier 2006) have argued that types are too coarse for many analyses of social identity, types based on decorative configurations are appropriate in the Caddo area for developing chronologies, examining regional affiliations, and discerning potential political boundaries.

I used established type names, such as Avery Engraved and Haley Engraved, where I could. When type names were first developed in the Caddo area, however, more effort was given to differentiating between fine wares than between utility wares. Therefore, within the utility wares of the Mountain Fork, I reworked the type definitions, basing them primarily on body decoration, and also added a type name, Dah-wat Incised. I also split some of the types into varieties based on minor variations within the overall unifying decorative configurations. These varieties are based solely on the Mountain Fork data and do not necessarily correspond to varieties created for other regions. The varieties assist with a finer-grained comparison of decorative practices among different communities. All of these categories should be subject to revision when more data are available, especially from neighboring valleys. Additionally, please keep in mind that photographs and drawings should be referred to whenever possible when comparing this analysis to those conducted in other times and places, because despite my best efforts I may have identified previously-named types differently than other researchers.

To more generally categorize all of Mountain Fork pottery I used several other overlapping levels of analysis. This helped to capture information on sherds without identifiable decorative configurations that could not be placed into a type or variety, more comprehensively using the available data. First, I classified every object by basic surface treatment and decorative intent: Plain, Burnished Undecorated, Red Slipped Plain, Utility Decorated, Fine Decorated, and Unclassified Decorated. I included smoothed sherds with the plain sherds because it was often difficult to draw a line between those two surface treatments. Pottery classified as utility decorated includes all jars or jar fragments (identified by rim attributes, neck-banding, or by decorative configurations unique to jar bodies), most sherds with incised rectilinear elements, most sherds with punctation, and all sherds with appliqué (excepting red-slipped sherds). Exceptions include Crockett Curvilinear Incised and Pennington Punctate Incised, which were classified as fine decorated. Fine decorated pottery also includes all engraved sherds, all red-slipped decorated sherds, and all sherds with incised curvilinear elements or hatching (except Military Road Incised sherds with meandering incised elements, which are clearly from utilitarian jars).

Sherds with parallel curved trailed lines were placed in the decorated unclassified category, because it was not possible to tell if these came from Keno Trailed bottles (fine) or from Foster Trailed-Incised or Haley Complicated Incised jars (utility). Foster Trailed-Incised vessels, along with certain other elaborately decorated jars, are difficult to classify as fine vs. utility wares because of their intricate and carefully executed designs but probable everyday functions. Sherds with lip notching but no other evident decoration were also placed in the decorated unclassified category, because although most lip notching occurred on complex carinated bowls with engraved designs, some has been seen on presumably utilitarian jars. These exceptions to the utility/fine ware divide show that this split is somewhat subjective for the modern analyst, but it holds up relatively well as a coarse measure of vessel function, or perhaps value or meaning to its maker or owner, based on time and care invested in decorative design and execution.

Each decorated sherd was also classified according its primary and secondary decorative techniques (incising, engraving, etc.) and by its basic elements and patterns (full-field punctate, meandering inscribed, etc.) In some cases these descriptions were sufficient to assign a sherd to a named type and often variety.

Regarding paste composition, temper was treated as a separate attribute, but was then considered in conjunction with these different classificatory categories. Lip and rim attributes, secondary shape characteristics such as handles, rim tabs, and bottle neck shapes, and lip decoration were subject to modal analysis. Vessel forms present identified at each site were compared, although small sample sizes in some cases made these comparisons tentative. When sample size was sufficient for a particular vessel form, vessel sizes were compared on the basis of rim diameter.

Next I will describe and compare the overall character of the assemblages.

Sample Size and Context

A discrepancy exists between sample size and contexts between sites (Figure 5.4 and Table 5.6). Much more extensive excavations took place at E. Johnson and Beaver, including mechanical grading, and a much greater quantity of pottery was found at these localities, both in absolute and relative terms. The pottery from these sites came from a variety of contexts, including structures, burials, pit features, midden deposits, and surface finds. Excavations of the mounds at Woods and Mound A at Biggham Creek were mainly by hand. Based on the volume of controlled excavations, considerably more pottery was found at Biggham Creek than at Woods. Excavations at Hughes and Ramos Creek were more limited and pottery sample sizes were smaller. At Hughes most of the pottery came from a series of test units that uncovered two features and part of a structure. At Ramos Creek, the majority of the pottery was from a single excavated structure and nearby feature, but more was found consistently in shovel tests across the terrace.

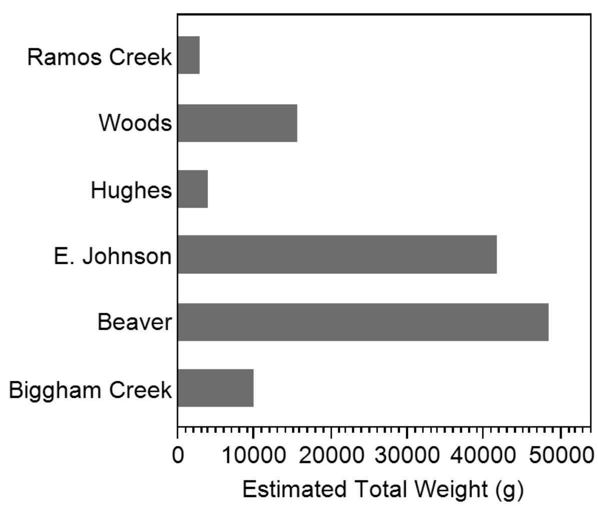


Figure 5.4. Estimated total weight of pottery (including estimated weight of whole vessels) found at each site. Sites listed by geographic location, from north to south.

Table 5.6. Ratio of pottery to excavated volume by site. Only pottery found during the controlled excavations (rather than the mechanical stripping) is counted.

Site	Volume of controlled excavations (cubic meters)	Weight of pottery found during controlled excavation (grams)	Ratio of pottery by weight to excavated volume (grams per cubic meter)
Ramos Creek Block 1	21.8	1799.4	82.6
Woods	157.9	14822.6	93.9
Hughes	32.9	3302.7	100.4
E Johnson	125.7	21896.9	174.2
Beaver	158.7	20393.0	128.5
Biggham Creek	58.0	7196.2	124.1

It would be preferable to compare pottery from distinct contexts within each of these sites, particularly in the case of the large E. Johnson and Beaver assemblages. However, except in the case of the burial vessels, this did not turn out to be particularly helpful. The vast majority of the pottery from these sites was from the graded areas and the pottery from non-burial features was rarely diagnostic. Because of this, most of the comparison in this project will be between site assemblages as a whole, despite the different distinct contexts and mixes of contexts present at each site.

Because of the smaller sample sizes at Hughes and Ramos Creek, comparisons between these assemblages and those of the other sites should be treated cautiously in some respects. Any diagnostic information present at these sites is valuable, but it is entirely possible that we are missing information. The more extensive excavations at the other sites provided much larger samples and we can be confident that we have a more accurate representation of the total pottery population from these localities.

Surface Treatment

The majority of the sherds (63 to 88 percent by count) at each site were either plain or smoothed (Tables 5.7, 5.8 5.9, and 5.10). Although the tables below describe surface treatment both by count and by weight, the percentages are here given by count because count is used consistently in this project to describe quantities of decorated sherds, except sometimes when dealing with temper. Most sites (except Ramos Creek) had a small quantity (two to seven percent) of burnished undecorated sherds, probably body sherds from fine decorated vessels. Likewise, all of the sites had a small quantity (under four percent) of red slip undecorated sherds, either from plain red slip vessels or from the bodies of decorated red slip vessels. Decorated sherds made up at least eight percent and up to 31 percent of the assemblages.

Table 5.7. Surface treatment of sherds and vessels (count at each site).

Site	Decorated unclassified	Fine Decorated	Utility Decorated	Red Plain	Burnished Undecorated	Plain/ Smoothed	Total
Ramos Creek	1	6	46	24	0	567	644
Woods	1	10	223	3	84	1322	1643
Hughes	1	15	129	6	15	294	460
E. Johnson	9	83	508	129	90	2640	3459
Beaver	1	86	747	148	185	3412	4589
Biggham Creek	5	60	190	18	73	721	1067

Table 5.8. Surface treatment of sherds and vessels (percent of total count by site).

Site	Decorated unclassified	Fine Decorated	Utility Decorated	Red Plain	Burnished Undecorated	Plain/ Smoothed	Total
Ramos Creek	0.16	0.93	7.14	3.73	0.00	88.04	100.00
Woods	0.06	0.61	13.57	0.18	5.11	80.46	100.00
Hughes	0.22	3.26	28.04	1.30	3.26	63.91	100.00
E. Johnson	0.26	2.40	14.69	3.73	2.60	76.32	100.00
Beaver	0.24	1.87	16.28	3.23	4.03	74.35	100.00
Biggham Creek	0.47	5.62	17.81	1.69	6.84	67.57	100.00

Table 5.9. Surface treatment of sherds and vessels (estimated weight in grams at each site).

Site	Decorated unclassified	Fine Decorated	Utility Decorated	Red Plain	Burnished Undecorated	Plain/ Smoothed	Total
Ramos Creek	13	34	456	64	0	2334	2900
Woods	1	114	3278	8	875	10592	14868
Hughes	4	58	1366	43	174	2209	3854
E. Johnson	62	6800	7966	634	825	22871	39157
Beaver	36	9986	10504	472	1667	23400	46064
Biggham Creek	25	1370	1846	54	589	5867	9750

Table 5.10. Surface treatment of sherds and vessels (percent of total estimated weight at each site).

Site	Decorated unclassified	Fine Decorated	Utility Decorated	Red Plain	Burnished Undecorated	Plain/ Smoothed	Total
Ramos Creek	0.46	1.16	15.71	2.19	0.00	80.48	100.00
Woods	0.01	0.76	22.05	0.05	5.89	71.24	100.00
Hughes	0.10	1.51	35.45	1.11	4.51	57.32	100.00
E. Johnson	0.16	17.37	20.34	1.62	2.11	58.41	100.00
Beaver	0.08	21.68	22.80	1.02	3.62	50.80	100.00
Biggham Creek	0.25	14.05	18.93	0.55	6.04	60.17	100.00

These numbers are most interesting when we start to look at the relative proportions of different classes of surface treatments. First, the ratio of fine decorated to utility decorated sherds and vessels (by count) was calculated for each site (Table 5.11, Figure 5.5). The average ratio for each site was 0.14 (14 fine decorated sherds for every 100 utility decorated sherds). Ramos Creek, Hughes, E. Johnson, and Beaver all hovered around this mean. The two mound sites sat at opposing extreme ends of this spectrum, however. At Biggham Creek the ratio of fine to utility decorated wares was relatively high (0.32), whereas at Woods the ratio was extremely low (0.04). This difference will be discussed and interpreted later.

Table 5.11. Ratios of fine decorated to utility decorated wares and of burnished to plain sherds (all by count).

Site	Fine Decorated: Utility Decorated	Burnished:Plain
Ramos Creek	0.13	0.00
Woods	0.04	0.06
Hughes	0.12	0.05
E. Johnson	0.16	0.03
Beaver	0.12	0.05
Biggham Creek	0.32	0.10
Overall	0.14	0.05

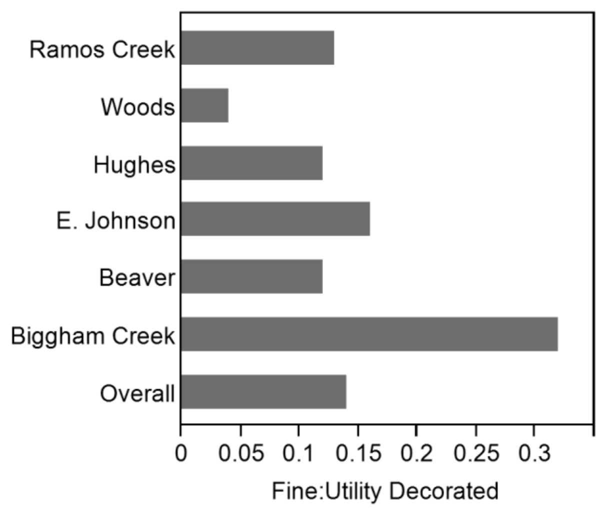


Figure 5.5. Ratio of fine decorated to utility decorated wares (by count). Note the difference between the two mound sites, Woods and Biggham Creek.

Next, the ratio of burnished undecorated to plain sherds was calculated. This is another indirect measure of the proportion of fine wares at a site. Except at Ramos Creek, which had no burnished undecorated sherds, the ratio mostly ranged from 0.03 to 0.06. At Biggham Creek, however, the ratio shot up to 0.10 (1 burnished undecorated sherd for every 10 plain sherds), suggesting again a far greater proportion of fine ware vessels here than at the other sites.

Additionally, all undecorated and decorated red slip sherds and vessels were combined to get a picture of the overall proportion of red slip pottery at each site (Table 5.12). At most of the sites the proportion of red slip sherds ranged from three to five percent, but at Woods it was only 0.24 percent. Combined with the low proportion of fine decorated wares, this suggests a significant difference between the Woods assemblage and those of the other sites.

Table 5.12. Count and proportion of red slipped sherds and vessels (undecorated and decorated) at each site. Note the low proportion of red slipped wares at Woods.

Site	Red Slip		Total Count
	n	%	
Ramos Creek	30	4.66	644
Woods	4	0.24	1643
Hughes	6	1.30	460
E. Johnson	139	4.02	3459
Beaver	158	3.44	4589
Biggham Creek	35	3.28	1067

Paste and Temper (Inclusions)

The Mountain Fork pottery was split into seven major paste categories based on the type, size, and density of the major temper classes. These categories are only approximate and could almost certainly be subdivided with more accurate temper identification techniques and more time. For the purposes of this project, however, the level of analysis was appropriate. The seven categories are coarse grog, sand-grog, grog, sand-grit, fine sand, shell, and bone (Tables 5.13 and 5.14). The undecorated sherds from these paste categories will not be assigned to types because many of the plain sherds probably come from the undecorated portions of decorated vessels that already have type names. It is potentially misleading to assign the undecorated sherds to types labeled as “plain” (for example, Smithport Plain) when they may very well come from decorated vessels. However, type names commonly assigned to these plain sherds will be mentioned for reference purposes. At least referencing these type names for undecorated sherds based on temper, surface treatment, and other attributes could be helpful in the future for making more detailed distinctions between paste categories and for regional comparisons.

Table 5.13. Estimated weight of sherds and vessels in each temper category (in grams).

Site	Coarse Grog	Sand-Grog	Grog	Sand-Grit	Fine Sand	Shell	Bone	Total
Ramos Creek	9	0	111	2553	145	69	0	2888
Woods	42	0	144	14286	154	242	0	14868
Hughes	323	24	1501	1237	478	173	115	3851
E. Johnson	7263	184	9051	15683	1064	5675	235	39157
Beaver	9257	187	9938	15211	706	9899	67	45264
Biggham Creek	740	139	4033	3145	772	825	97	9750
Total	17635	534	24778	52116	3319	16883	514	115779

Table 5.14. Estimated proportion of sherds and vessels in each temper category (by weight, in grams).

Site	Coarse Grog	Sand-Grog	Grog	Sand-Grit	Fine Sand	Shell	Bone
Ramos Creek	0.32	0.00	3.84	88.42	5.02	2.40	0.00
Woods	0.28	0.00	0.97	96.08	1.03	1.63	0.00
Hughes	8.39	0.63	38.97	32.13	12.42	4.49	2.98
E. Johnson	18.55	0.47	23.12	40.05	2.72	14.49	0.60
Beaver	20.45	0.41	21.95	33.61	1.56	21.87	0.15
Biggham Creek	7.59	1.42	41.36	32.26	7.92	8.46	0.99
Total	15.23	0.46	21.40	45.01	2.87	14.58	0.44

Coarse grog tempered sherds have large, often irregularly shaped, and dense grog temper. They are often thick and infrequently decorated. These are usually labeled as Williams Plain in the literature (Brown 1996:343-348). At times, when they are somewhat thinner with slightly less large pieces of grog, they have been called LeFlore Plain (Rogers 1980, 1982), although others define LeFlore Plain exclusively as a grit tempered ware (Early 1988:64; Schambach 1982). Coarse grog temper is usually associated with pre-A.D. 1200 contexts in the Caddo area, although a terminal age has not been firmly established (Brown 1996:345).

Coarse grog sherds occurred most frequently in the E. Johnson and Beaver assemblages (18 to 21 percent by weight), less frequently at Biggham Creek and Hughes, and very infrequently at Ramos Creek and Woods. The mean thickness of coarse grog sherds in the Mountain Fork assemblages is 8.0 mm (excluding base sherds, n=1466).

Sand-grog tempered sherds have a paste composed of very dense fine sand and some large grog particles. This may also be an early ware, because of the relative thickness of these sherds. None occurred in the Ramos Creek or Woods assemblages and few were present at the other sites. The mean thickness of sand-grog sherds in the Mountain Fork assemblages is 7.4 mm (excluding base sherds, n=49).

Grog tempered sherds existed in all the Mountain Fork assemblages, most frequently at Hughes, E. Johnson, Beaver, and Biggham Creek (21 to 42 percent). They occurred less often at Ramos Creek (3.84 percent) and at Woods (0.97 percent). Sherds in this category have small to medium grog particles as the primary tempering agent, interspersed with small to moderate quantities of sand and grit, and sometimes some bone particles. The mean thickness of grog tempered sherds in the Mountain Fork assemblages is 6.5 mm (excluding bases, n=3435).

Grog tempered types in the Caddo area include Smithport Plain, Paris Plain, and Sanders Plain (Brown 1996:348-349, 401-403). Brown distinguishes between these three types mainly based on surface treatment: Smithport Plain is actually plain, Paris Plain is burnished, and Sanders Plain is slipped (differing from the original definition of Sanders Plain in Suhm and Jelks [1962:139]). LeFlore Plain has also been considered primarily a grog tempered ware (Brown 1971b, 1996:346), although its definition has diverged to include grog-bone tempered wares (Rogers 1980, 1982) and grit tempered wares (Schambach 1982; Early 1988:64). Poole Plain is another grog or clay tempered type that is considered to be local to the Ouachita Mountains (Early 1988:66-67; Wood 1981:35).

Sand-grit tempered sherds include all those with grit particles as the primary tempering agent and sheds with medium to large sand particles as the primary tempering agent. Frequently these were mixed together. The two northernmost sites, Ramos Creek and Woods, had particularly large amounts of sand-grit sherds (88 and 96 percent respectively). The other sites had lower proportions, ranging from 32 to 40 percent. The mean thickness of sand-grit tempered sherds in the Mountain Fork assemblages is 6.1 mm (excluding bases, n=5462).

Pottery tempered primarily with grit is reportedly common to surface collections made in Arkansas along the Ouachita and Caddo Rivers, the Saline River, and in the eastern Ouachitas (Early 1988:65). Several names have been given to the undecorated grit tempered wares in this region, including Ouachita Plain (later placed under LeFlore

Plain) and Ouachita Ironware (Schambach 1970, 1982:162-163). LeFlore Plain and Ouachita Ironware, however, are considered to date to the Late Woodland and early Caddo period, predating A.D. 1100 (Brown 1996:346-348; Early 1988:65). Sites in the Ouachita Mountains that date to the Caddo period, including the fifteenth century Standridge and Winding Stair sites in Arkansas, are dominated by grog and shell tempered wares (Early 1988, 2000). Gettys (1975:155) mentions a set of sherds at the Pine Creek Mound site along the Glover River in southeastern Oklahoma tempered with medium to coarse grained sand that may be similar to some of the sand-grit tempered sherds at Ramos Creek and Woods. Based on fourteenth-century radiocarbon dates acquired from Ramos Creek and Woods, and the likelihood that Pine Creek also dates to this period, it seems possible that this temper may be common to the mid-Ouachita Mountains prior to A.D. 1400.

Fine sand tempered sherds include all those with small round particles of sand as the primary tempering agent. These were present in small quantities (mostly less than 10 percent) in all the assemblages. The mean thickness of fine sand tempered sherds in the Mountain Fork assemblages is 5.9 mm (excluding bases, n=551).

Shell tempered sherds were classified as those with shell (or evidence of eroded shell) present in any quantity, including those with additional grog or sand-grit temper. Few shell tempered sherds were present in the Ramos Creek, Woods, or Hughes assemblages (one to five percent). More were present at Biggham Creek (eight percent), E. Johnson (14 percent), and Beaver (22 percent). The mean thickness of shell tempered sherds in the Mountain Fork assemblages is 5.8 mm (excluding bases, n=597).

Undecorated shell tempered sherds are commonly placed in the categories of Woodward Plain (mostly used for the Arkansas River basin) (Brown 1996:389-391) and Poteau Plain (Brown 1971b:184-191; Early 1988:68). The use of shell temper generally appeared later in the Caddo area than in other parts of the Southeast, usually after A.D. 1300 (Perttula et al. 2012). Even then, it was not used consistently across the area. In the northern Ouachita Mountains at sites along the Caddo River, to the east of the Mountain Fork, shell tempering does not appear until around A.D. 1400 (Perttula et al. 2012:248).

Finally, bone tempered sherds included those with bone as the primary tempering agent. Few of these were recorded at any site; most sherds only had bone particles as a secondary temper. The mean thickness of bone tempered sherds in the Mountain Fork assemblages is 6.5 mm (excluding bases, n=89). One undecorated bone tempered type in the Caddo area is Cooper Boneware (Early 1988:63-64; Schambach 1970:83-91).

Regarding the categories of surface treatment discussed above in relation to temper, it is interesting to note the high proportion (56 percent) of fine decorated wares with shell temper and the high proportion (60 percent) of utility decorated wares with sand-grit temper (Tables 5.15 and 5.16). Undecorated red slip sherds are mostly grog tempered (62 percent) but a relatively large number are also shell tempered (16 percent). No category of surface treatment is dominated by a single paste, though.

Table 5.15. Weight (grams) of sherds and vessels within each temper category, by surface treatment.

Surface Treatment	Coarse Grog	Sand-Grog	Grog	Sand-Grit	Fine Sand	Shell	Bone	Total
Decorated Unclassified	28	20	28	39	1	24	0	140
Fine Decorated	195	13	2165	5065	348	9765	10	17560
Utility Decorated	1755	30	4718	15290	265	3232	126	25416
Red Slip Undecorated	114	0	793	106	37	204	21	1273
Burnished Undecorated	969	0	1319	1567	184	78	13	4130
Plain - Smoothed	14573	471	15756	30050	2485	3580	344	67259

Table 5.16. Proportion (by weight) of sherds and vessels within each temper category, by surface treatment.

Surface Treatment	Coarse Grog	Sand-Grog	Grog	Sand-Grit	Fine Sand	Shell	Bone	Total
Decorated Unclassified	19.97	14.19	19.76	28.10	0.78	17.19	0.00	100.00
Fine Decorated	1.11	0.07	12.33	28.84	1.98	55.61	0.06	100.00
Utility Decorated	6.91	0.12	18.56	60.16	1.04	12.72	0.50	100.00
Red Slip Undecorated	8.98	0.00	62.26	8.31	2.87	15.98	1.61	100.00
Burnished Undecorated	23.47	0.00	31.93	37.94	4.46	1.89	0.31	100.00
Plain - Smoothed	21.67	0.70	23.43	44.68	3.69	5.32	0.51	100.00

When comparing the mean thicknesses of different temper categories, the coarse grog and sand-grog tempered sherds are thickest (8.0 and 7.4 mm), followed by the grog, bone, and sand-grit tempered sherds (6.5, 6.5, and 6.1 mm) (Figure 5.6, Table 5.17). The fine sand and shell tempered sherds are thinnest (5.9 and 5.8 mm).

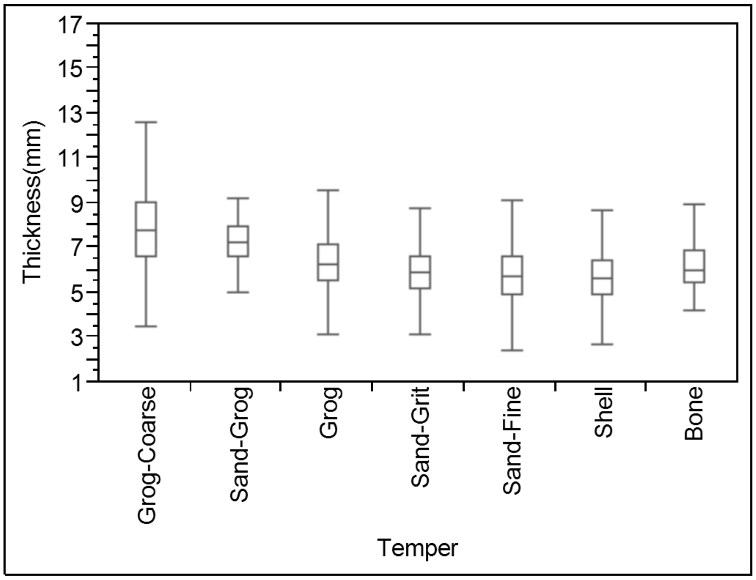


Figure 5.6. Oneway analysis of thickness (mm) of sherds by temper (excluding base sherds).

Table 5.17. Thickness of sherds by temper (excluding base sherds).

Temper	Number	Mean (mm)	Range (mm)
Coarse Grog	1466	8.0	3.6-16.2
Sand-Grog	49	7.4	5.1-10.8
Grog	3435	6.5	1.4-15.2
Sand-Grit	5462	6.1	1.7-13.7
Fine Sand	551	5.9	2.2-16.7
Shell	597	5.8	2.8-15.2
Bone	89	6.5	3.2-11.6

Decorative Intent

Attributes related to decorative intent including technique, location of decoration, elements, patterns, and configuration were recorded for each decorated sherd and vessel. Based on this information and our current knowledge of whole vessels in this region, it is technically now possible to put together a descriptive classification system such as that used in Arkansas. For decorated sherds and vessels in this analysis, however, I am primarily focusing on those that I can assign to named types, because many of the named types are chronologically sensitive and are useful for both inter-site and inter-regional comparisons. All sherds that could confidently be typed were assigned to general and more specific decorative categories based on techniques and patterns. These were compared across sites, but no useful patterns emerged that were not more readily observable when comparing named types. Appliqué decoration was treated modally and compared across sites, but again, no notable patterns were observed.

Decorative Types

A total of 22 named and provisionally-named types were identified in the Mountain Fork pottery assemblages (Figure 5.7, Table 5.18). These included types that were clearly local and present in relatively large numbers as well as some imports that indicate ties to other regions. The most prevalent and probably local types are Avery Engraved, Hodges Engraved, Hudson Engraved, Simms Engraved, Crockett Curvilinear Incised, Spiro Engraved, Canton Incised, Emory Punctate Incised, Harleton Applique, McKinney Plain, and Dah-wat Incised. The less prevalent types are more likely to be imports, potentially indicating social connections with other regions. Alternatively lesser prevalence may indicate low sample numbers, especially when the less prevalent types occurred at Ramos Creek and Hughes, where the total number of sherds found was considerably lower than at the other site. Accordingly, low numbers should be treated cautiously, but not ignored. For a summary of the data presented in this section, see Tables 5.21 though 5.27 and Figures 5.47 through 5.52.

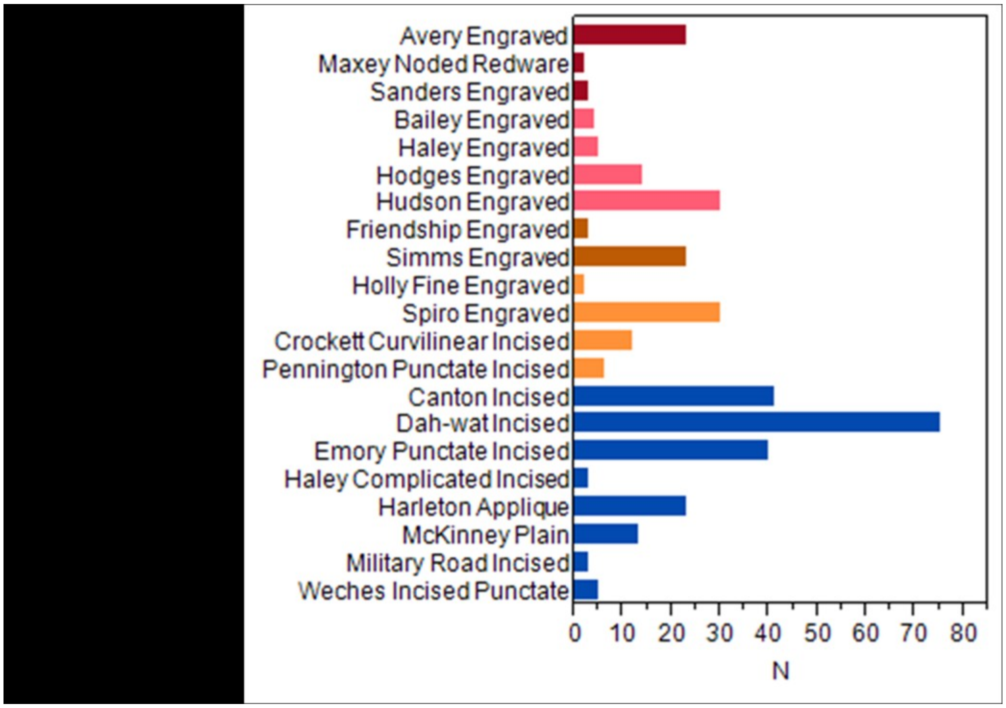


Figure 5.7. Distribution of named types in the Mountain Fork assemblage (by count). Types are grouped by color based on various common attributes. Avery through Sanders are red slipped. Bailey through Hudson are decorated bottles. Friendship and Simms are decorated complex carinated bowls. Spiro through Pennington are all finely executed, relatively early wares. Canton through Weches include types often classified as utility vessels and are mainly jars.

Table 5.18. Total count and weight of decorative types in the Mountain Fork assemblage.

Decorative Type	Total count	Total estimated weight (g)	Sherd count	Whole vessel count
Avery Engraved	23	2534	20	3
Sanders Engraved	3	28	3	0
Maxey Noded Redware	2	6	2	0
Bailey Engraved	4	1609	2	2
Haley Engraved	5	79	5	0
Hodges Engraved	14	834	13	1
Hudson Engraved	30	2509	27	3
Simms Engraved	23	4901	17	6
Friendship Engraved	3	48	3	0
Spiro Engraved	30	2653	27	3
Holly Fine Engraved	2	805	1	1
Crockett Curvilinear Incised	12	84	12	0
Pennington Punctate Incised	6	79	6	0
Canton Incised	41	829	41	0
Emory Punctate Incised	40	582	40	0
Harleton Applique	23	1379	22	1
Haley Complicated Incised	3	32	3	0
McKinney Plain	13	5408	7	6
Military Road Incised	3	152	3	0
Dah-wat Incised	75	4598	70	5
Weches Incised Punctate	5	20	5	0
Total	358	27570	329	29

These numbers almost certainly under-represent the types present in the Mountain Fork assemblages. The sample here of 358 sherds and vessels only includes those that could unequivocally be assigned to relatively easily recognizable decorative types. This sample will be used to address chronology, regional affiliations, and possibly shifting political affiliations among the Mountain Fork sites. A map is presented for reference here, marked with select sites mentioned in the upcoming text.

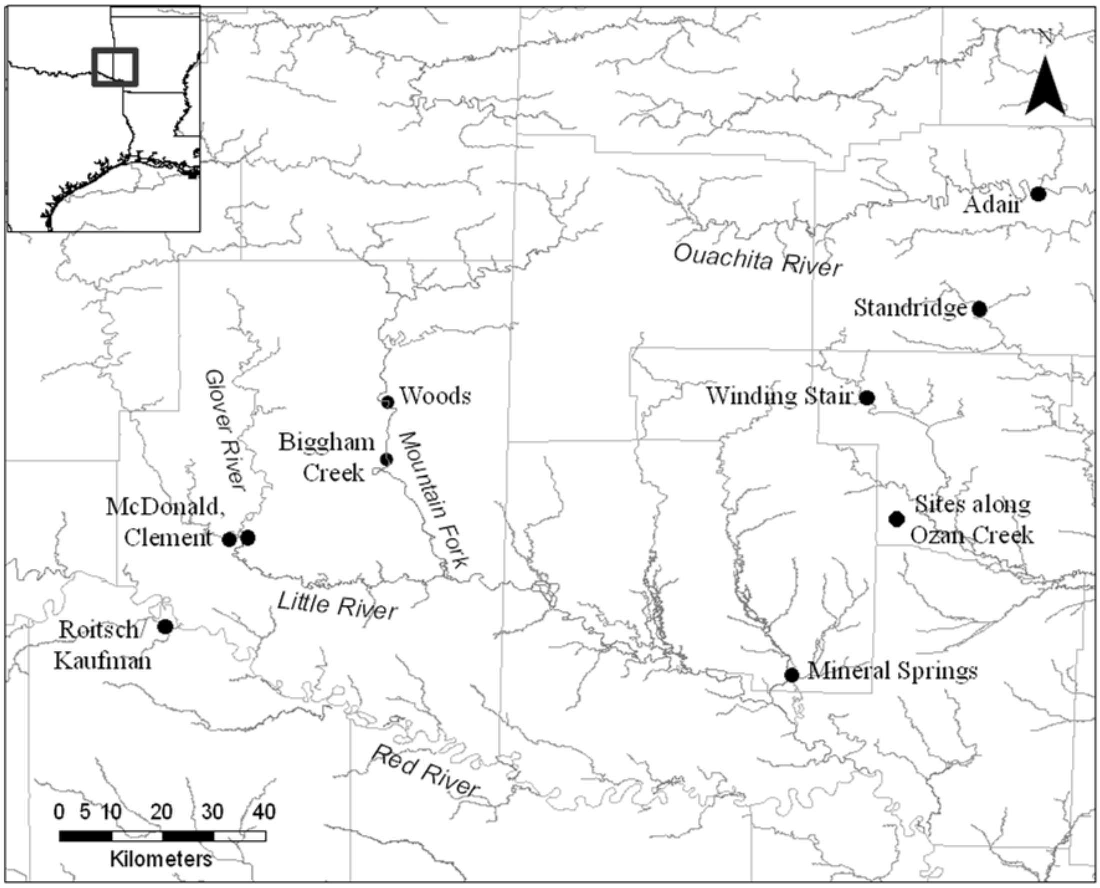


Figure 5.8. Approximate location of select Caddo sites mentioned in the text.

Red Slip Decorated Vessels

Three red slip types were identified in the Mountain Fork assemblages: Avery Engraved, Maxey Noded Redware, and Sanders Engraved.

Avery Engraved. Avery Engraved vessels are usually relatively large, deep simple bowls, carinated bowls, or jars with long necks. They were almost always red slipped and then engraved. The engraved elements include concentric circles, hatched bands, curved lines embellished with triangles or spurs, and concentric triangles. Avery Engraved vessels occur most often at McCurtain phase sites in the Little River and Red River valleys from around A.D. 1250/1300 to 1700 (Bruseth 1998; Perttula 1992:127-130; Suhm and Jelks 1962:1-3, Plates 1, 2).

Avery Engraved sherds (n=20) and vessels (n=3) from the Mountain Fork assemblages include 3 from E. Johnson, 7 from Beaver, and 13 from Biggham Creek. These sherds and vessels are overwhelmingly shell tempered (99.1 percent by weight), with some grog (0.7 percent) and some fine sand (0.2 percent) temper. Two decorative varieties were identified. The curvilinear variety of Avery Engraved has semi-circular linear elements embellished with triangles or spurs, sometimes adjacent to hatched zones. These elements are similar to those described from the Sam Kaufman (Roisch) site (Skinner et al. 1969) that date to the earlier part of the McCurtain phase, around A.D. 1250 to 1500 (Perttula 1992:Table 11). Another set of sherds and vessels within this variety are characterized by vertical zones of cross-hatching bordering sets of concentric circles.

The chevron variety of Avery Engraved has a decorative field around the rim of the vessel, filled with nested triangles alternately pointing up and down. Sometimes the outermost triangle delineated with a hatched band. Other times the triangles are not nested, but are instead filled with parallel diagonal lines. The chevron variety also probably dates to the early part of the McCurtain phase, from around A.D. 1250 to 1500 (Perttula 1992:Table 11; Skinner et al. 1969). Both the curvilinear and chevron varieties are fairly evenly distributed between E. Johnson, Beaver, and Biggham Creek.

Another variety of Avery Engraved is characterized by scroll elements and dates to the later part of the McCurtain phase, from around A.D. 1500-1700, at least at sites along the middle Red River (Perttula 1992:Table 11; Skinner et al. 1969). This variety was not present in the Mountain Fork assemblages.

Figure 5.9. Avery Engraved sherds with curvilinear elements, lines embellished with triangles or spurs, and hatched zones (all from Biggham Creek).

Figure 5.10. Avery Engraved sherds with chevron elements (from Biggham Creek).

Figure 5.11. Avery Engraved simple bowl with chevron elements from E. Johnson.

Maxey Noded Redware. These red-slipped bottles have vertical rows of appliqué nodes or ridges. They are primarily from the Sanders or Mound Prairie phases along the middle Red River from around A.D. 1100 to 1300 (Bruseth 1998), although some vessels were also found at the Adair site in southwest Arkansas (Suhm and Jelks 1962:101, Plate 51). Two grog tempered sherds of Maxey Noded Redware were present in the E. Johnson assemblage.

Figure 5.12. Maxey Noded Redware sherd from E. Johnson.

Sanders Engraved. Sanders Engraved vessels are most commonly carinated bowls that are occasionally red-slipped (Suhm and Jelks 1962:137, Plate 69). They are engraved around the rim with simple rectilinear elements including diagonal parallel lines, triangles filled with parallel lines, or sets of hatched triangles. These vessels are most common to the Sanders and Mound Prairie phases of the middle Red River from around A.D. 1100-1300 (Bruseth 1998). One grog-tempered sherd from a Sanders Engraved carinated bowl was present in the Ramos Creek assemblage. It was red-slipped with parallel diagonal lines engraved on the rim. Two more grog-tempered Sanders Engraved sherds were present in the E. Johnson assemblage.

Figure 5.13. Sanders Engraved carinated bowl rim from Ramos Creek.

Decorated Bottles

A number of types consist almost exclusively of finely-decorated bottles. Those found in the Mountain Fork assemblages include Bailey Engraved, Haley Engraved, Hodges Engraved, Hudson Engraved, Taylor Engraved, and possibly Keno Trailed.

Bailey Engraved. These bottles are characterized by sets of concentric arcs that repeat four times around the upper part of the body (Suhm and Jelks 1962:5, Plate 3). Downward-facing sets of arcs fill the space between the four upper sets, filling the whole body of the bottle. Bailey Engraved vessels apparently occur infrequently at sites in northeastern Oklahoma, southwestern Arkansas, and northwestern Louisiana in middle to late Caddo contexts (Suhm and Jelks 1962:5).

Two Bailey Engraved vessels and two sherds were present in the Mountain Fork assemblages. The vessels, both from E. Johnson (441 and 640), are sand-grit tempered. The sherds are from E. Johnson (grog tempered) and Biggham Creek (sand-grit tempered). The co-occurrence of the Bailey vessels at E. Johnson with Avery Engraved vessels in Burials 11 and 13 suggest that this type dates to sometime before A.D. 1500 here.

Figure 5.14. Bailey Engraved bottle (broken neck) from E. Johnson.

Haley Engraved. Haley Engraved bottles have bands of fine parallel line that form interlocking scrolls, meanders, and rectilinear panels (Suhm and Jelks 1962:61, Plate 31). This is a widespread type, most common during the middle Caddo period Mineral Springs phase contexts along the Little River (A.D. 1300-1450) and Spiro phase contexts in the Arkansas Valley (A.D. 1350-1450) (Bohannon 1973; Brown 1996; Hoffman 1969). This may hint at connections during this period between the Ouachita Mountains and the Arkansas Valley (Brown 1996:1999).

There are 5 sherds of Haley Engraved present in the Mountain Fork assemblages, including 2 from Woods (shell tempered), 2 from Beaver (grog tempered), and 1 from Biggham Creek (fine sand tempered). The Woods sherds, from Mound A, are clearly from the same vessel. The rectilinear design on the Woods sherds is very similar to a vessel from Burial 4 at the Mineral Springs site (Bohannon 1973:Figure 7j).

Figure 5.15. Haley Engraved sherds from Biggham Creek.

Figure 5.16. Haley Engraved sherd from Woods.

Hodges Engraved. These bottles are characterized by engraved cross-hatched bands that form interlocking scrolls, frequently punctuated by negative circles (Suhm and Jelks 1962:73-75, Plates 37, 38). Lines embellished with ticks are sometimes present between the bands. Hodges Engraved vessels are most common to southwestern Arkansas and to locations along the Great Bend of the Red River (Bruseth 1998; Early 2002a). At the Mineral Springs site, they are present with burials dating to Mineral Springs V, around A.D. 1350-1450 (Bohannon 1973). At Belcher phase sites they generally are present in contexts dating after A.D. 1500 (Perttula 1992:102; Webb 1959:153).

A single Hodges Engraved vessel and 13 sherds are present in the Mountain Fork assemblages, including 6 sherds from E. Johnson, 4 from Beaver, and 3 from Biggham

Creek. The vessel, from E. Johnson, is a compound vessel with two distinct decorative configurations, Hodges and Taylor Engraved. It is discussed further below. Excluding the vessel, the sherds are 58.6 percent grog tempered (by weight), 27.6 percent sand-grit tempered, 6.9 percent fine sand tempered, and 6.9 percent bone tempered.

Figure 5.17. Hodges Engraved sherds.

Taylor Engraved. Taylor Engraved vessels include deep simple and carinated bowls and bottles, sometimes red slipped, and engraved with a band of interlocking scrolls (Suhm and Jelks 1962:149-151, Plates 75, 76). The only incidence of a Taylor Engraved configuration present in the Mountain Fork assemblages is on the upper portion of a compound vessel from E. Johnson (cat. 447). The lower portion has a Hodges Engraved configuration. This vessel is not red slipped and is sand-grit tempered. It is composed of two globular bodies separated by a moderately constricted neck. The uppermost part of the vessel is broken off, but given the tight constriction at the breaking point a bottle neck may have been present. According to Suhm and Jelks (1962:151) Taylor Engraved vessels are found at sites throughout northeastern Texas, southwestern Louisiana, and southwestern Arkansas in the middle

Caddo period. They are a major local type for the Cypress, Sulphur, and Sabine drainages in northeastern Texas after A.D. 1500 (Perttula 1992:102-103).

Hudson Engraved. Suhm and Jelks (1962:81, Plate 41) defined a type known as Hudson Engraved, which included bottles with both engraved and incised elements. All of the vessels in the Mountain Fork assemblages with Hudson Engraved configurations are trailed and incised, rather than engraved, perhaps indicating a local stylistic variation. The Hudson Engraved bottles in the Mountain Fork assemblages are characterized by bands of interlocking scrolls that are usually defined by trailed lines and filled with incised hatching or cross-hatching. The general configurations are similar to those on Hodges Engraved vessels, but the technique is different and cross-hatching tends to be more pronounced. Vessels defined as Hudson Engraved are most common to McCurtain phase sites post-A.D. 1400/1500 (Bruseth 1998; Perttula 1992:Table 11, 2008:340).

Three Hudson Engraved vessels and 27 sherds are present in the Mountain Fork assemblages. One whole vessel is from Biggham Creek (cat. 5, grog tempered) and two are from Beaver (cat. 907 and 920, respectively shell and sand-grit tempered). The sherds include three from Hughes, 13 from Beaver, and 11 from Biggham Creek. By weight, 0.5 percent of all the Hudson Engraved sherds and vessels are coarse grog tempered, 34.3 percent are grog tempered, 32.8 percent are sand-grit tempered, 0.6 percent are fine sand tempered, and 31.9 percent are shell tempered.

Figure 5.18. Hudson Engraved sherds.

Keno Trailed. Keno Trailed is mentioned here because it is likely that some is present in the Mountain Fork assemblages. The main design on Keno Trailed bottles is composed of curvilinear trailed lines in interlocking scroll or spiral patterns (Suhm and Jelks 1962:87, Plate 44). A sherd with parallel curvilinear trailed lines could also be interpreted as coming from the body of a Foster Trailed-Incised or Haley Complicated Incised jar, though, making absolute identification difficult without further information. Only seven sherds with parallel curved trailed lines were present in the assemblages, one from Hughes, two from E. Johnson, three from Beaver, and one from Biggham Creek.

Middle and Late Caddo Decorated Carinated Bowls

Friendship Engraved. These vessels primarily include carinated and complex carinated bowls with engraved rim panels (Suhm and Jelks 1962:45, Plate 23). Designs are complicated, involving multiple panels of cross-hatched bands, ticked lines, and scrolls. Friendship Engraved vessels are most common to the Mid-Ouachita phase from around A.D. 1400 to 1500, although some vessels also occur at the Mineral Springs site along the Little River and in the Arkansas Valley during the Spiro phase from around A.D. 1350-1450 (Bohannon 1973; Brown 1996; Early 2002b). Like Haley Engraved vessels, Friendship Engraved vessels also suggest connections between the Ouachita Mountains and the Arkansas Valley during the middle Caddo period (Brown 1996:1999).

Three Friendship Engraved sherds are present in the Mountain Fork assemblages, including two large sherds from Woods and one from Beaver. The two from Woods are clearly from the same vessel and are sand-grit tempered. The sherd from Beaver is grog tempered.

Figure 5.19. Friendship Engraved complex carinated bowl sherd from Woods.

Simms Engraved. Simms vessels are complex carinated bowls with sharp angles between the upper and lower rim segments and between the lower rim segment and the body (Suhm and Jelks 1962:141, Plate 71). Most vessel bodies are rounded. Decoration is all on the narrow lower rim panel and includes stylized scrolls, rectangles embellished with ticked lines, diagonal ticked lines, and sets of parallel vertical straight or curved lines. Usually the pattern repeats four times around the vessel. Simms Engraved is a late McCurtain phase type, generally post-dating A.D. 1500 (Bruseth 1998; Perttula 2008).

Six Simms Engraved vessels and 17 sherds are present in the Mountain Fork assemblages. The vessels include four from Beaver (cat. nos. 366, 908, 921, and 924) and two from E. Johnson (cat. nos. 208 and 448). Sherds include one from E. Johnson and 15 from Biggham Creek. By weight, 98 percent of the sherds and vessels are shell tempered, 0.9 percent are fine sand tempered, and 0.9 percent are grog tempered, and 0.2 percent are sand-grit tempered.

The Mountain Fork assemblages include two varieties of Simms Engraved and one possible earlier type. A curvilinear variety of Simms Engraved has elements that include curved parallel lines and scrolls. These correspond to the Simms Engraved Class A vessels described at the Sam Kaufman/Roitch site along the Red River (Skinner et al. 1969:44). Two curvilinear Simms vessels and one sherd are present at Beaver. The rectilinear variety of Simms Engraved is characterized by diagonal lines, sometimes embellished by ticks or triangles and sometimes partially underlain by sets of parallel vertical lines. Other patterns include rectangular panels embellished on the interior with ticks and sets of vertical parallel lines. These correspond to Kaufman/Roitch site Simms Engraved Class B, which appears to be a later variety than Class A (Skinner et al. 1969:44, 68-70). Rectilinear Simms is the most prevalent variety along the Mountain Fork, with two vessel each at E. Johnson and Beaver, one sherd at E. Johnson, and 15 sherds at Biggham Creek.

Figure 5.20. Simms Engraved complex carinated bowl rim sherd from E. Johnson.

Figure 5.21. Simms Engraved complex carinated bowl from Beaver.

Some complex carinated bowls in the Mountain Fork assemblage look like possible simpler versions of Simms Engraved. These bowls have straight, rather than rounded, bodies, and a single horizontal line spanning the lower rim panel. One vessel each is present at E. Johnson (cat. no. 209, Figure 5.22) and Beaver (cat. no. 914) and a sherd is present at Ramos Creek.

Figure 5.22. Carinated bowl with straight sides from E. Johnson.

Early Caddo Fine Wares

Before around A.D. 1350, a number of fine ware types were widespread across the Caddo Area. Types that are present in the Mountain Fork assemblages include Spiro Engraved, Holly Fine Engraved, Crockett Curvilinear Incised, and Pennington Punctate Incised.

Spiro Engraved. These vessels include bottles and bowls with finely engraved complex combinations of straight and curved lines and sometimes punctation (Suhm and Jelks 1962:147, Plate 74). Common designs include sets of diagonal or horizontal parallel straight lines bounding concentric circles or semicircles. The decorative field usually extends over the entire body of the vessel. Sometimes the top of the decorative field is delimited by horizontal parallel lines circling the vessel.

Spiro Engraved vessels were widespread across the northern and southern Caddo areas during the early Caddo period. They are common to Harlan and Norman phase (ca. A.D. 1100-1350) sites in the Arkansas Valley, the Mineral Springs III period (ca. A.D. 1250-1350), and probably the later part of the Lost Prairie phase at sites along the Red River (ca. 900-1250) (Brown 1996; Bruseth 1998; Bohannon 1973).

Three Spiro Engraved vessels and 27 sherds are present in the Mountain Fork assemblages. The vessels are all from Beaver (cat. nos. 369, 370, 426), from Burials 2 and 4. They include one bottle and two simple bowls with two opposite rim taps. The sherds include seven from E. Johnson, 18 from Beaver, and two from Biggham Creek. By weight, the sherds and vessels are 34.3 percent grog tempered, 31.6 percent sand-grit tempered, 30.4 percent shell tempered, 3.7 percent coarse grog tempered, and 0.2 percent bone tempered.

Figure 5.23. Spiro Engraved sherd from E. Johnson.

Figure 5.24. Spiro Engraved sherd from E. Johnson.

Holly Fine Engraved. These vessels are usually carinated bowls with finely engraved diagonal parallel lines and excised triangular areas along the rim panel (Suhm and Jelks 1962:77-79, Plates 39, 40). Only one vessel of this type is present in the Beaver assemblage, a grog-tempered complex carinated bowl from Burial 4. One sherd of grog-tempered Holly Fine Engraved also was found in the E. Johnson assemblage. Holly Fine Engraved vessels are another early type common across the Caddo area. They are present in the Harlan phase in the Arkansas Valley (ca. A.D. 1100-1250), Millers Crossing phase along the Little River (ca. A.D. 900-1150), at the George C. Davis site in northeastern Texas, and at the Crenshaw and Gahagan sites along the Red River (Brown 1996; Hoffman 1969; Suhm and Jelks 1962:79).

Crockett Curvilinear Incised. The next two types, Crockett Curvilinear Incised and Pennington Punctate Incised, are similar in terms of the decorative techniques used and to some extent their configurations. Crockett and Pennington are here labeled as fine wares because of their carefully planned designs and precise execution. Canton Incised vessels are somewhat similar in terms of the pattern used, but less care was taken in design and execution and so Canton is placed with the utility wares.

Crockett Curvilinear Incised vessels are mainly carinated bowls and some simple bowls with decoration on a panel around the rim (Suhm and Jelks 1962:31-33, Plates 16, 17). Although some of the decorative panels are confined to a zone near the rim, others extend down the body of the vessel. Configurations are often composed of scrolls delineated by central circles and triangular zones, each filled with punctation. In the Mountain Fork assemblages configurations are only partially visible, but variations on the scroll motif exist. Additionally, tool punctation is the primary punctate technique. Several local styles appear to exist, but they are not distinctive enough to be labeled varieties. One style includes parallel curved lines bordered by zones of punctation. Another includes single curved lines and sometimes parallel horizontal lines bordering broad zones of punctation. A third style is clearly part of the Crockett canon, but includes some rectilinear as well as curvilinear decoration. In that variation punctation is used linearly rather than as fill. Configurations include punctate arches and vertical and horizontal lines, bordered and punctuated by incised lines.

The Mountain Fork assemblages have 12 sherds of Crockett Curvilinear Incised, including five from Hughes, three from E. Johnson, and four from Beaver. By weight, the sherds are tempered with 17.3 percent coarse grog, 6.2 percent sand-grog, 65.9 percent grog, 7.2 percent sand-grit, and 3.5 percent bone.

Crockett Curvilinear Incised vessels are common throughout the Caddo area from around A.D. 1100 through A.D. 1300/1350, although they may have become less common along the Red River after A.D. 1200 (Bohannon 1973; Brown 1996; Hoffman 1969; Early 2002c; Bruseth 1998).

Figure 5.25. Crockett Curvilinear Incised sherds from E. Johnson.

Figure 5.26. Crockett Curvilinear Incised sherds from Hughes.

Figure 5.27. Crockett Curvilinear Incised sherds from Beaver.

Pennington Punctate Incised. As with the previous type, most Pennington Punctate Incised vessels are carinated bowls with a decorative band around the rim (Suhm and Jelks 1962:121, Plate 61). Pennington designs are usually rectilinear, though, rather than curvilinear. They include alternating triangles filled with punctation, diamonds delineated by punctate zones, and diagonal zones alternatively blank and filled with punctation.

Three sherds of a plain tool punctate variety of Pennington Punctate Incised are present in the Mountain Fork assemblages, including two from E. Johnson and one from Beaver. The sherds are either sand-grog or grog tempered.

Another variation of Pennington in the Mountain Fork assemblages includes sherds incised with nested Vs formed by incised bands, which are flanked with reed punctation. One sherd is present at E. Johnson and two at Beaver. The largest sherd is tempered with coarse grog and the other two are tempered with grog and fine sand. A very similar design is present on vessels from the Mineral Springs site and the Washington site in the Ozan valley of southwestern Arkansas (Harrington 1920:Plates XXVIa and XXVIIa).

Suhm and Jelks (1962:121) considered Pennington to be mainly resident to Texas and Louisiana, only occurring farther north as a trade ware. Pennington occurs from around A.D. 1100 through A.D. 1200/1250, ending earlier than Crockett (Brown 1996; Hoffman 1969; Bruseth 1998).

Figure 5.28. Pennington Punctate Incised sherd from E. Johnson.

Figure 5.29. Pennington Punctate Incised sherd from Beaver.

Utility Decorated Vessels

Utility decorated vessels include jars and some bowls decorated primarily with incised, punctate, and appliqué patterns. Types present in the Mountain Fork assemblages include Canton Incised, Weches Incised Punctate, McKinney Plain, Harleton Appliqué, Emory Punctate Incised, Dah-wat Incised, Military Road Incised, and Haley Complicated Incised.

Canton Incised. These vessels are some of the earlier decorated utility wares to appear in this region. They include large jars and simple deep bowls (Suhm and Jelks 1962:23, Plate 12). Decorative configurations include alternating sets of diagonal incised lines bordering triangular zones of punctation around the rim of the vessel (here labeled Canton Incised punctate) and alternating sets of diagonal incised lines without punctation around the rim of the vessel (Canton Incised plain). When the first configuration occurs on the top part of the body of a jar, it is here called Canton Incised body.

The punctate configurations of Canton Incised are similar to those of Pennington Punctate Incised, except that the Canton configurations are less finely executed and no blank spaces exist between the zones of punctation. Canton Incised vessels seem to have been a relatively regional development around the middle Red River, where they occur in Sanders and Mound Prairie phase contexts around A.D. 1100-1300 and in the southern Ouachita Mountains in Mineral Spring II and Early Graves Chapel contexts around A.D. 1150-1250 (Bohannon 1973; Bruseth 1998; Hoffman 1969). They may have been directly inspired by Pennington Punctate Vessels imported from the south.

Overall, 41 sherds of Canton Incised are present in the Mountain Fork assemblages, including two sherds from Woods, three from Hughes, 10 from E. Johnson, and 26 from Beaver. It is possible that more were present in the assemblages that could not be positively identified as Canton, because diagonal incised lines were common to a number of different types. Canton punctate sherds are present at Hughes (n=3) and Beaver (n=5). Canton plain sherds are present at E. Johnson (n=5) and Beaver (n=8). Canton body sherds are present at Woods (n=1), E. Johnson (n=1), and Beaver (6). Twelve sherds could not be assigned to a variety. Regarding paste composition, by weight 10.3 percent of the sherds are tempered with coarse grog, 22.1 percent with grog, 59.6 percent with sand-grit, 5.3 percent with fine sand, 1.4 percent with shell, and 1.3 percent with bone.

Figure 5.30. Canton Incised rim sherds.

Weches Incised Punctate. This type is characterized by multiple rows of horizontal incised lines filled with bands of linear fingernail punctation around the rim (Suhm and Jelks 1962:153, Plate 77). Vessel forms include jars and some carinated bowls. Weches is an Alto phase type during the early Caddo period, so its presence in the Mountain Fork assemblages implicates southern connections during this period. Five sherds are present, three from E. Johnson and two from Beaver. Two different stylistic variations were identified, the first with horizontally-oriented fingernail punctation and the second with diagonally-oriented fingernail punctation. The two variations are present at both sites. By weight, 73.1 percent of the sherds are grog tempered, 15.4 percent are coarse grog tempered, and 11.4 percent are sand-grit tempered.

Figure 5.31. Weches Incised Punctate rim sherds.

Military Road Incised. These jars are distinguished by one or more meandering incised lines circling the vessel, alternating with rows of diagonal or vertical parallel lines (Suhm and Jelks 1962:107, Plate 54). They occur principally in southwestern Arkansas in Mineral Springs phase and Mineral Springs V contexts (A.D. 1300-1400/1450) and at Mid-Ouachita phase context (A.D. 1400-1500) (Bohannon 1973; Early 2002b; Hoffman 1969). Towards the latter part of the Mid-Ouachita phase, Foster Trailed-Incised vessels replaced Military Road Incised vessels (Early 2002b, 2002d).

Military Road decorative modes also occur in Buckville phase contexts in the Upper Ouachita Valley, but Early (1981:58) has pointed out their dissimilarities to Military

Road Incised vessels as originally defined. It will be a matter for future investigation to see if the Mountain Fork Military Road sherds are more similar to the Buckville styles than the originally-defined vessels. Two grog-tempered Military Road Incised sherds are present in the Hughes assemblage and one sand-grit tempered sherd is present in the Woods assemblage, indicating a possible connection to southwestern Arkansas for these two sites.

Figure 5.32. Military Road Incised rim sherd from Hughes.

Haley Complicated Incised. These jars are usually not neck-banded, but instead have complex incised and appliqué designs that cover the entire vessel (Suhm and Jelks 1962:59, Plate 30). Major elements include nodes surrounded by incised circles, arched impressed appliqué ridges, and horizontal and diagonal tightly spaced parallel incised lines. The nodes surrounded by circles likely inspired the later Foster Trailed-Incised type (Suhm and Jelks 1962:43, Plate 22).

Only a few Haley Complicated Incised sherds (n=3) were present in the Mountain Fork assemblages at E. Johnson. All were grog tempered. Haley Complicated Incised jars are primarily from southwest Arkansas, where they have been found in Mineral Springs phase and Mineral Springs V contexts (A.D. 1300-1450) and in Mid-Ouachita phase contexts (A.D. 1400-1500) (Bohannon 1973; Early 2002b; Hoffman 1969). The presence of these sherds at E. Johnson points to a connection with southwest Arkansas. The particular configuration of the sherds is very similar to that on a vessel from Burial 9 at Mineral Springs (Bohannon 1973:Figure 10j).

Figure 5.33. Haley Complicated Incised sherds from E. Johnson.

McCurtain Phase Jars. Type designations among a whole series of McCurtain phase jars variously called McKinney Plain, Nash Neck Banded, and Emory Punctate Incised are currently a mess. The major problem is that these types have been variously defined based on rim decoration, body decoration, and combinations thereof. The manner in which vessels from the Bob Williams and Roden sites (along the Red River) were assigned to these types is particularly troubling (Perino 1981, 1983). The Arkansas descriptive system has the right idea here in separating out rim and body decorations, which based on my review of vessels from sites along the Glover River, Mountain Fork River, and Red River were clearly interchanged among these types. This issue needs more work than I am prepared to take on here, but this may serve as a start.

I will be treating the rim decoration modally and focusing instead on the body decoration in order to classify sherds and vessels into types for this project. Patterned variation among body decoration has not been extensively documented for these jar types. I am abandoning the Nash Neck Banded designation entirely for the moment, because it was based almost solely on the rim decoration. Looking for trends in how the rim and body decorations are combined across the area would likely be quite informative, but because I do not have a very large sample size of whole vessels from the Mountain Fork assemblages it is beyond the scope of this project. I recognize that some researchers in the Caddo Area will disagree with my type designations, but hope they will agree that order needs to be derived from the pea-soup of McCurtain phase jar types even if they disagree with my means of doing so.

Rim decoration varies throughout the McCurtain phase jars. Vessels were formed by coiling rolls of clay and then smoothing the coils. On many McCurtain phase jars, the rim coils were only partially smoothed and then pinched, making rows of parallel rough ridges as described for Nash Neck Banded vessels by Suhm and Jelks (1962:111). Sometimes fingernail punctate overlay these ridge-pinched rows. Other times the rim coils were more or less smoothed and rows of either fingernail or tool punctate took the place of ridge-pinching, producing a similar configuration with a different technique. As I mentioned earlier, this variation represents stylistic elaborations on the same basic idea of neck-banding. The distribution of these different elaborations, their combination with different body decorations, and their presence on different jar shapes deserves a thorough review that I am not pursuing here.

Nash Neck Banded, McKinney Plain, and Emory Punctate Incised vessels in general were omnipresent along the middle Red River and the Little River from around A.D. 1300 onward (Bruseth 1998; Hoffman 1969). I am hopeful that refining these type designations to focus more fully on body decoration may assist in refining their chronological sensitivity.

McKinney Plain. This type was defined by Suhm and Jelks (1962:97, Plate 49) as having a plain body split into four sections by vertically-oriented appliqué ridges or sets of nodes. They noted that the rims of these vessels were generally rough and bumpy, indicating coils that were not entirely smoothed. Sometimes a row of punctation was present at the base of the rim. The type was defined primarily based on vessels at the Hatchel site (Bowie Co., Texas). Suhm and Jelks (1962:111, Plate 56) also noted that Nash Neck Banded vessels often had rows of appliqué nodes or ridges on their bodies, or appliqué chevrons.

Appliqué vertical ridges and sets of nodes occur frequently on all of the McCurtain phase jar types, including those with incised and punctate designs in the intervening panels. Because of this I am treating them as a modal form of decoration and focusing on the panels in between in order these types for this study. Accordingly, McKinney Plain vessels are here classified as neck-banded jars with plain bodies, except for four vertical appliqué ridges or sets of nodes often spaced evenly around the body.

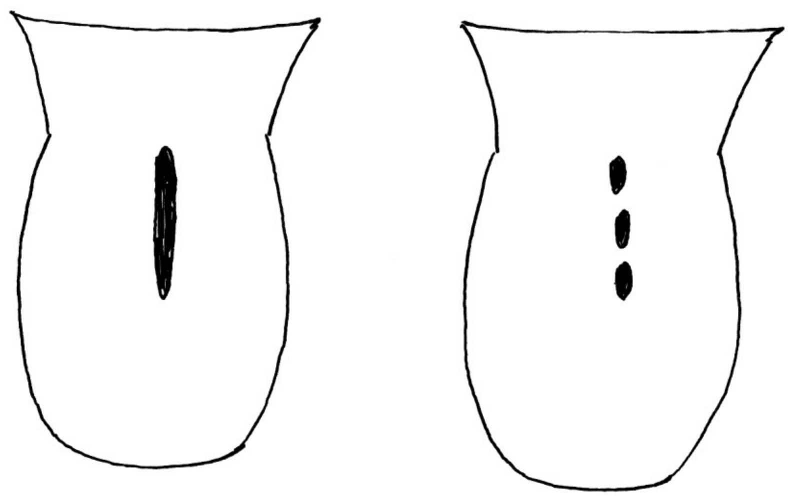


Figure 5.34. Example of appliqué ridges and vertically-stacked nodes on the bodies of jars. These forms of appliqué are modal and may occur on McKinney Plain vessels or other jar types.

Seven sherds and six vessels of McKinney Plain were positively identified among the Mountain Fork assemblages. This number very likely under-represents the presence of the type because I only counted sherds (or vessels) for which it was clear that no other decoration was present besides the vertical ridges and nodes. The type was identified at Woods (n=6), E. Johnson (n=3), and Beaver (n=4). By weight, 84.6 percent of McKinney Plain sherds and vessels were sand-grit tempered, 14.8 percent were shell tempered, and 0.6 percent were grog tempered.

Figure 5.35. McKinney Plain vessel from Beaver.

Harleton Appliqué. Some may dispute my use of this term to refer to jars from the Mountain Fork assemblages, because it was defined originally based on vessels from Titus phase sites in Texas. It is the best fit, however, for a series of jars with appliqué chevron designs and panels of vertical appliqué outlined by curvilinear appliqué. Suhm and Jelks (1962:65, Plate 33) described a number of different patterns for this type, including "scrolls, chevrons, panels of vertical lines, concentric diamonds … [that] may cover the whole body or the upper part." They also noted that the appliqué ridges were often punctated.

The Harleton variants present along the Mountain Fork included those with chevrons and those with panels of vertical ridges located on the upper part of the body. Usually these patterns are repeated two or four times around the body of the vessel. It may be that this type should be assigned a separate name, but it also seems appropriate to simply list these as northern varieties of Harleton Appliqué. Although Suhm and Jelks (1962:65) did not recognize ridge-pinched necks among the Titus phase jars, this was likely a modal stylistic difference that was differentially transmitted from the body design.

The Mountain Fork assemblages include 22 sherds and one vessel of Harleton Appliqué. The vessel is from E. Johnson. The sherds are from E. Johnson (n=3), Beaver (n=9), and Biggham Creek (n=10). Most of the Harleton Applique sherds and the one vessel were grog tempered (66.3 percent by weight). The remainder were tempered with shell (15.9 percent), coarse grog (9.8 percent), and sand-grit (8.0 percent).

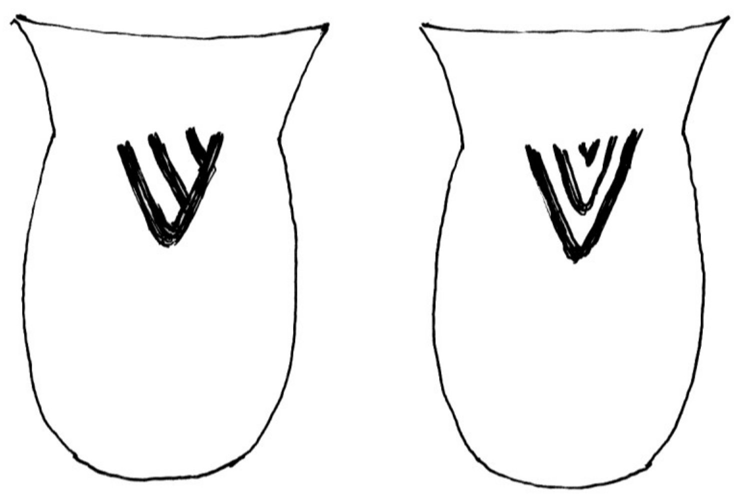


Figure 5.36. Harleton Appliqué jars with chevron patterns.

Figure 5.37. Harleton Appliqué sherd from Beaver.

Emory Punctate Incised. The type name "Emory Punctated" first appeared in Harris and colleagues' (1965:299) description of the Womack site (Lamar Co., Texas). A description was published by Story and colleagues (1967:136-139) in a more thorough site report for Womack. They wrote:

> "Some vessels have only punctations arranged into one to four rows around the vessel, usually just below the lip. If brushing is present, it may occur almost anywhere on the vessel, from the lip to the base. If incising is present, it usually consists of straight to slightly curved lines extending from below the rim to the base or to about the middle of the body. Punctations are often combined with either incising or brushing, and on some vessels all three decorative techniques are utilized." (Story et al. 1967:137)

At the time, the defining characteristics for this type in Texas were rows of punctation on the rim and vertically-oriented straight or curved incised lines, linear punctate, and brushing on the body. Since then, the type has taken on a life of its own (Gregory 2005; Gregory and Avery 2007; Perino 1981, 1983; Perttula 2005:186). Gregory and Avery (2007:33) note that one variation present at the Los Adaes site in Texas could be called Louisiana Emory. The variation present in the Mountain Fork assemblages is similar to vessels from sites along the Glover River, the middle Red River, and sometimes at Ouachita Mountain sites in Arkansas including Standridge (Early 1993) and sites in the Ozan drainage (Harrington 1920).

Emory Punctate Incised jars along the Mountain Fork are characterized by incised and linear punctate patterns repeated four times around the body. The patterns are bounded by vertical appliqué ridges or sets of nodes. The rectilinear variety, which is most common in the Mountain Fork assemblages, is comprised of horizontal rows of linear punctation circling the vessel at the top and bottom of the ridges or sets of nodes. On many vessels the panels between the appliqué are then filled with alternating vertical incised lines and linear punctation. A second curvilinear variety is more common at the McDonald site along the Glover River (Dowd 2011c) and at sites in southwestern Arkansas in the Ozan drainage (Harrington 1920) than at the Mountain Fork sites. These jars have incised or linear punctate arcs between the appliqué ridges or nodes.

These two varieties could be referred to jointly as McCurtain Emory Punctate Incised, or we could give them new names altogether. Chase Earles (personal communication 2012), a member of the Caddo Nation and a well-known artist, has suggested the names *Ti'dut* ("little ants") for the rectlilinear variety and *Wis'nah-win* ("rainbow") for the curvilinear variety. Ti'dut and Wis'nah-win Punctate Incised are my suggestions if we decide new names are appropriate. In the meantime I will stick with Emory Punctate Incised.

A total of 40 Emory Punctate Incised sherds are present in the Mountain Fork assemblages, including two from Ramos Creek, 10 from Woods, one from Hughes, 9 from E. Johnson, 15 from Beaver, and three from Biggham Creek. Sherds from the rectilinear variety make up the majority of the type (n=38) and are present at all the sites. Only two sherds from the curvilinear variety are present at Beaver. By weight, the majority of the Emory Punctate Incised sherds are sand-grit tempered (88.2 percent). Some (9.2 percent) are grog tempered and a few (2.6 percent) are shell tempered.

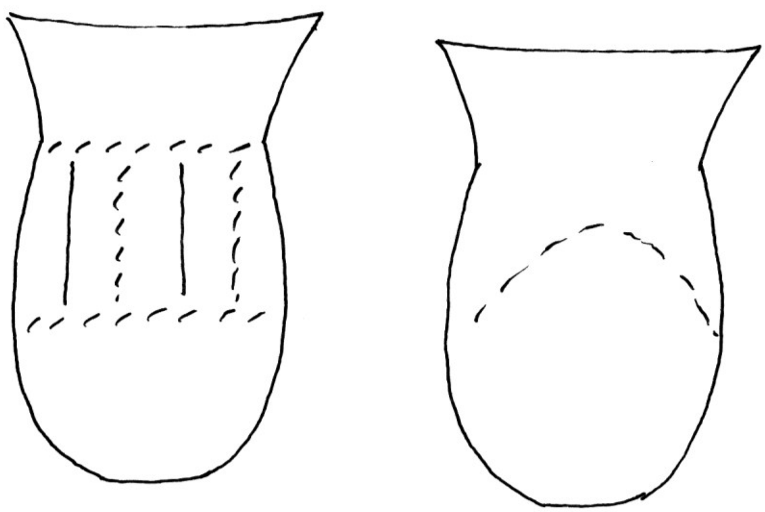


Figure 5.38. Emory Punctate Incised jars. Rectilinear variety on the left is most common along the Mountain Fork.

Figure 5.39. Emory Punctate Incised sherd from Ramos Creek.

Dah-wat Incised. I have assigned a new name to this type based on comparisons between jars at sites along the Mountain Fork and the nearby Glover River (Dowd 2011c). Chase Earles (personal communication 2012) suggested the name *Dah-wat*, which means “basket” in Caddo and is fairly easy to say and remember. Dah-wat Incised jars are characterized by incised diagonal designs that often cover a large portion of the body. Appliqué ridges are sometimes present on Dah-wat bodies, but not as frequently as they are on the bodies of Emory Punctate Incised vessels. One jar that fits this description was illustrated by Suhm and Jelks (1962:111, Plate 56) under Nash Neck Banded, but they stated that incising across the body was unusual. Evidently this type was uncommon among the vessels surveyed at that time.

The configurations present on Dah-Wat Incised jars are somewhat similar to those present on some of the Dunkin Incised vessels defined by Suhm and Jelks (1962:37,

Plate 19) and identical to at least one Dunkin Incised Jar from the Poole site in the Upper Ouachita Valley (Wood 1981:Figure 2b). However, because all of the Duncan vessels illustrated in Suhm and Jelks (1962:37) are from the George C. Davis site, I believe that a new type name is necessary for this distinctive set of Ouachita Mountain vessels because of their homogeneity within a limited geographic region.

Four possible varieties of Dah-wat Incised were defined for the Mountain Fork assemblages. The predominant variety (quadripartite) has a few different configurations, all featuring a quadripartite scheme of diagonal incised lines that repeats two or four times around the body. One configuration is comprised of nested Vs facing up, down, to the left, and to the right, in which the innermost Vs form a large X shape (Chase Earles [personal communication 2012] also liked the name *Bah'* ["arrows] for this configuration). Another is defined by an X in which each segment is filled with diagonal parallel lines. Sometimes this alternates with a series of nested diamonds. Occasionally this variety intersects with the rectilinear variety of Emory Punctate Incised in that a row of horizontal linear punctation separates bands of parallel incised diagonal lines. Although these configurations are not exactly alike, they frequently co-occur on the same vessel and so are included in the same variety.

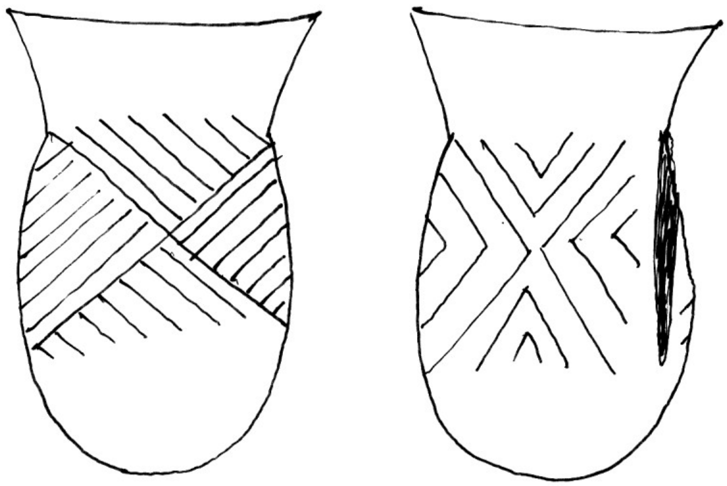


Figure 5.40. Dah-wat Incised jars. Vessel on the right has an appliqué ridge delineating incised panel.

The next three variations are only tentatively included with this type. They similarly solely use incised diagonal lines, but they occur in low numbers. The first variation (chevron) is characterized by diagonal parallel lines divided by a vertical line. This mainly takes the form of a pendant triangle or chevron. At sites along the western Little River (at the McDonald site) and the middle Red River this incised chevron is often paired with a long vertically-oriented paired scroll, but this element is not present within the Mountain Fork assemblages.

Only one example of the second variation (herringbone) is present in the Mountain Fork assemblages, at Beaver. This variety has a herringbone pattern at the top of the body. This is almost identical to a vessel from near Hot Springs illustrated by Harrington (1920:Plate XLVIa). The third variation (diagonal intersect) also appears sparse in the Mountain Fork assemblages, but that may be misleading. This variety has diagonal intersecting lines across the body. This pattern also may occur on the rims of jars, though, and so the only sherds identified as this variety were those clearly from jar bodies. Other sherds with diagonal intersecting lines were identified in the assemblages.

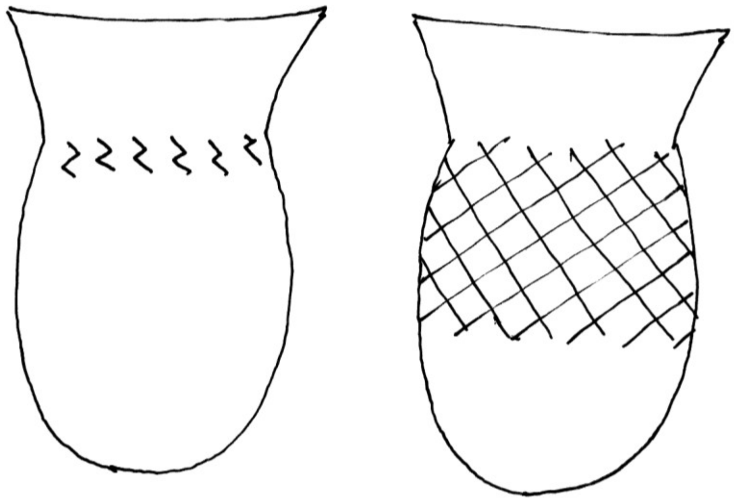


Figure 5.41. Other incised jars, tentatively associated with Dah-wat Incised.

Five vessels and 70 sherds of Dah-wat are present in the Mountain Fork assemblages. Two whole vessels were present at Beaver (one quadripartite and one chevron) and three were at E. Johnson (all quadripartite). Sherds included seven from Ramos Creek, one from Woods, two from Hughes, 19 from E. Johnson, 30 from Beaver, and 11 from Biggham Creek. Most of the sherds were the quadripartite variety, but some from E. Johnson (n=7), Beaver (n=6) and Biggham Creek (n=1) were the chevron variety. As stated before, only one sherd from Beaver was present for the herringbone variety. Only two sherds of diagonal intersect variety were present at E. Johnson, but more may have been present in the assemblages that could not positively be identified as Dah-wat Incised.

Figure 5.42. Dah-wat Incised sherd from Biggham Creek.

Figure 5.43. Dah-wat Incised sherd from Biggham Creek.

Figure 5.44. Dah-wat Incised vessel from E. Johnson.

A striking contrast exists between the temper proportions for the Dah-wat Incised sample (Tables 5.19 and 5.20) versus the Emory Punctate Incised sample. For the Dah-wat Incised sherds and vessels, shell temper made up a significant proportion of the assemblage (35.6 percent by weight), whereas for the Emory Punctate Incised sherds it was only a minor (2.6 percent). The rest of the Dah-wat Incised sherds and vessels were tempered with sand-grit (60.2 percent by weight), grog (3 percent), coarse grog (1.2 percent), and fine sand (0.02 percent). The high percentage of shell among the Dah-wat Incised sample suggests that this type might have extended to a later date than the local variety of Emory Punctate Incised. Burial associations at Beaver and E. Johnson with rectilinear Simms Engraved, Avery Engraved, Hudson Incised, and Hodges Engraved *var. Taylor* vessels also support this interpretation.

Table 5.19. Temper of Dah-wat Incised sherds and vessels by site (weight in grams).

Site	Coarse Grog	Grog	Sand-Grit	Fine Sand	Shell	Total
Ramos Creek	2	22	46	0	0	71
Woods	0	0	5	0	0	5
Hughes	0	0	25	0	0	25
E. Johnson	0	56	1645	1	806	2507
Beaver	6	51	847	0	830	1734
Biggham Creek	48	11	198	0	0	256

Table 5.20. Temper of Dah-wat Incised sherds and vessels by site (percent of weight).

Site	Coarse Grog	Grog	Sand-Grit	Fine Sand	Shell	Total
Ramos Creek	2.97	31.54	65.49	0.00	0.00	100.00
Woods	0.00	0.00	100.00	0.00	0.00	100.00
Hughes	0.00	0.00	100.00	0.00	0.00	100.00
E. Johnson	0.00	2.21	65.60	0.04	32.15	100.00
Beaver	0.33	2.91	48.87	0.00	47.89	100.00
Biggham Creek	18.58	4.10	77.32	0.00	0.00	100.00

Possible Effigies

Fingertip Impressed Red Slip Rim Sherd. One grog-tempered, red-slipped sherd from a vessel with an extended rim was present in the E. Johnson assemblage. The top of the rim is indented with three fingertip impressions. At first I thought this might be from a vessel with a Redwine rim mode, with an undulating rim that projects horizontally outward from the body of the vessel (Walters 2010). The rim does not project very far, however, and Amanda Regnier (personal communication 2012) suggests that it looks more like part of a Mississippian effigy vessel, except for the red slip.

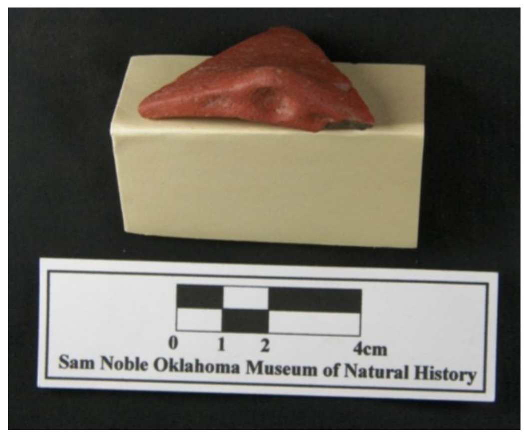


Figure 5.45. Two images of the fingertip impressed red slip rim sherd from E. Johnson.

Hollow Leg. One hollow leg sherd was present at Biggham Creek. It is uncertain what sort of vessel this may have come from.

Figure 5.46. Hollow leg from effigy vessel, from Biggham Creek.

Table 5.21. Count of decorative types by site, including sherds and vessels.

Decorative Type	Ramos Creek	Woods	Hughes	E. Johnson	Beaver	Biggham Creek	Total count
Avery Engraved	0	0	0	3	7	13	23
Sanders Engraved	1	0	0	2	0	0	3
Maxey Noded Redware	0	0	0	2	0	0	2
Bailey Engraved	0	0	0	3	0	1	4
Haley Engraved	0	2	0	0	2	1	5
Hodges Engraved	0	0	0	7	4	3	14
Hudson Engraved	0	0	3	0	15	12	30
Simms Engraved	0	0	0	3	5	15	23
Friendship Engraved	0	2	0	0	1	0	3
Spiro Engraved	0	0	0	7	21	2	30
Holly Fine Engraved	0	0	0	1	1	0	2
Crockett Curvilinear Incised	0	0	5	3	4	0	12
Pennington Punctate Incised	0	0	0	3	3	0	6
Canton Incised	0	2	3	10	26	0	41
Emory Punctate Incised	2	10	1	9	15	3	40
Harleton Applique	0	0	0	4	9	10	23
Haley Complicated Incised	0	0	0	3	0	0	3
McKinney Plain	0	6	0	3	4	0	11
Military Road Incised	0	1	2	0	0	0	3
Dah-wat Incised	7	1	2	22	32	11	75
Weches Incised Punctate	0	0	0	3	2	0	5
Total count	10	24	16	87	150	71	358

Table 5.22. Count of decorative types and varieties by site, including sherds and vessels.

Decorative types and varieties	Ramos Creek	Woods	Hughes	E. Johnson	Beaver	Biggham Creek	Total count
Avery Engraved chevron	0	0	0	1	1	2	4
Avery Engraved curvilinear	0	0	0	2	6	11	19
Maxey Noded Redware	0	0	0	2	0	0	2
Sanders Engraved	1	0	0	2	0	0	3
Bailey Engraved	0	0	0	3	0	1	4
Haley Engraved	0	2	0	0	2	1	5
Hodges Engraved	0	0	0	6	4	3	13
Hodges-Taylor Engraved	0	0	0	1	0	0	1
Hudson Engraved	0	0	3	0	15	12	30
Friendship Engraved	0	2	0	0	1	0	3
Simms Engraved curvilinear	0	0	0	0	3	0	3
Simms Engraved rectilinear	0	0	0	3	2	15	20
Crockett Curvilinear Incised	0	0	5	3	4	0	12
Holly Fine Engraved	0	0	0	1	1	0	2
Pennington Punctate	0	0	0	2	1	0	3
Pennington Punctate Incised reed	0	0	0	1	2	0	3
Spiro Engraved	0	0	0	7	21	2	30
Canton Incised plain	0	0	0	6	8	0	14
Canton Incised punctate	0	0	3	0	5	0	8
Canton Incised body	0	1	0	1	6	0	8
Canton Incised unclassified	0	1	0	3	7	0	11
Emory Punctate Incised rectilinear	2	10	1	9	13	3	38
Emory Punctate Incised curvilinear	0	0	0	0	2	0	2
Haley Complicated Incised	0	0	0	3	0	0	3
Harleton Applique chevron	0	0	0	2	9	10	21
Harleton Applique vertical panel	0	0	0	2	0	0	2
McKinney Plain	0	6	0	3	4	0	11
Military Road Incised	0	1	2	0	0	0	3
Dah-wat Incised quadripartite	7	1	2	13	24	10	57
Dah-wat Incised pendant	0	0	0	7	7	1	15
Dah-wat Incised diagonal intersect	0	0	0	2	0	0	2
Dah-wat Incised herringbone	0	0	0	0	1	0	1
Weches Incised Punctate	0	0	0	3	2	0	5
Total count	10	24	16	87	150	71	358

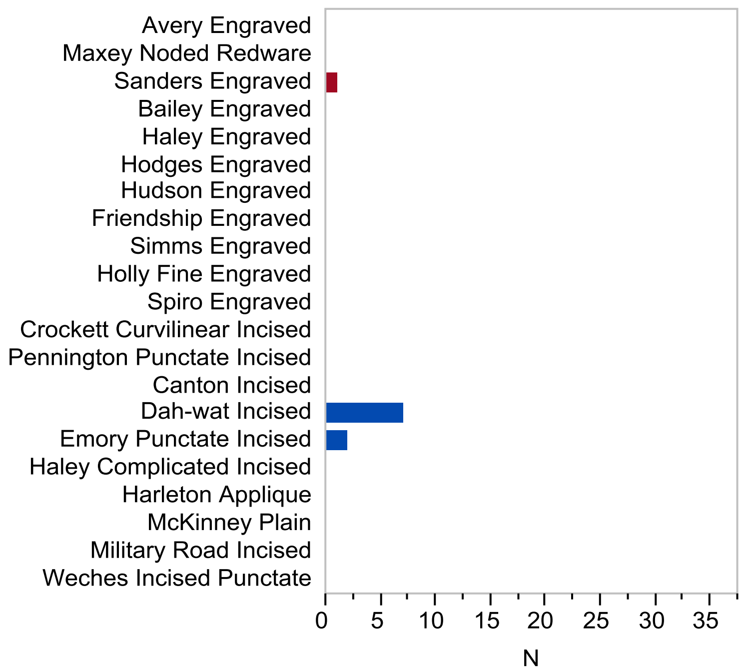


Figure 5.47. Decorative types at Ramos Creek.

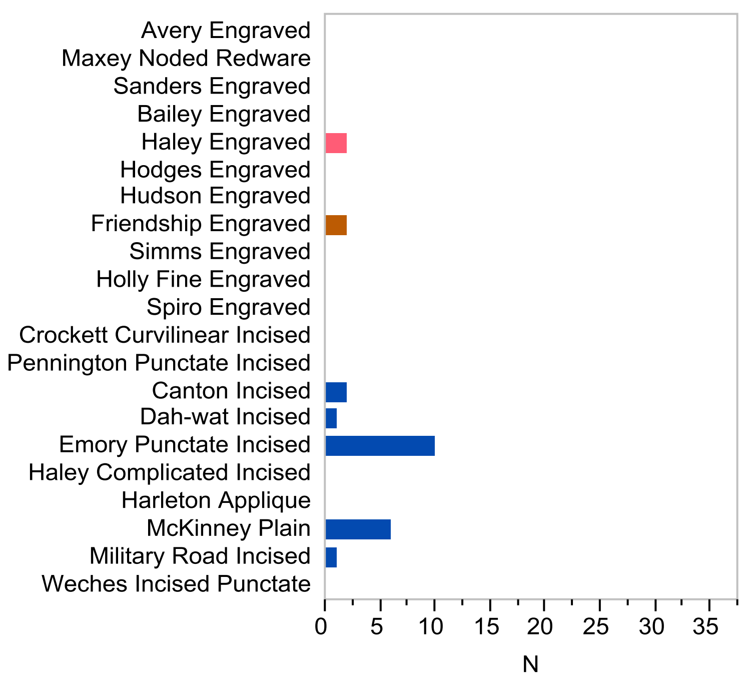


Figure 5.48. Decorative types at Woods.

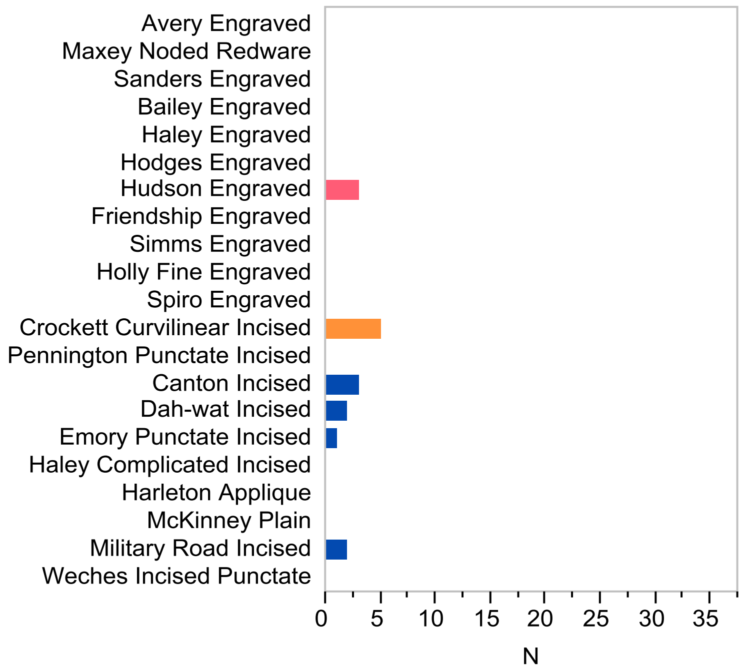


Figure 5.49. Decorative types at Hughes.

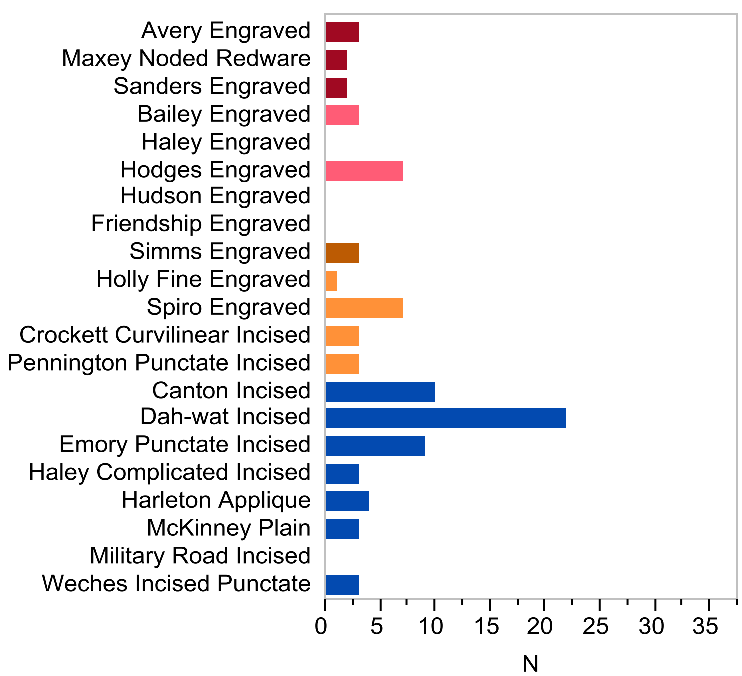


Figure 5.50. Decorative types at E. Johnson.

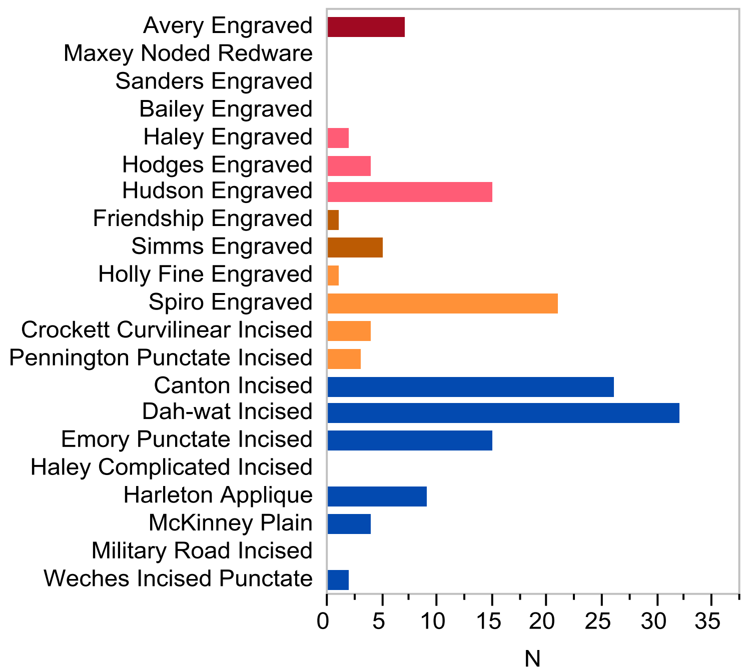


Figure 5.51. Decorative types at Beaver.

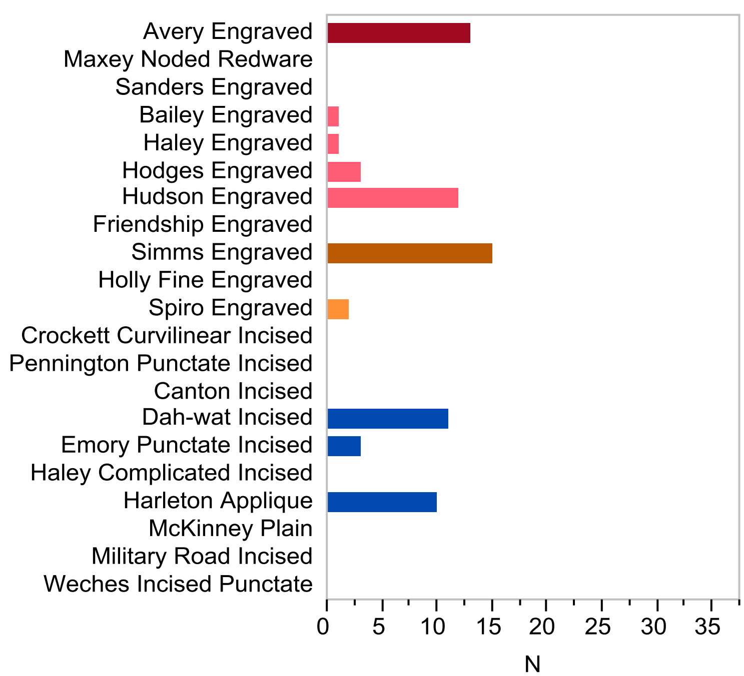


Figure 5.52. Decorative types at Biggham Creek.

Table 5.23. Decorative types by temper (by estimated weight in grams).

Decorative Type	Coarse Grog	Sand-Grog	Grog	Sand-Grit	Fine Sand	Shell	Bone	Total
Avery Engraved	0	0	19	0	5	2511	0	2534
Sanders Engraved	0	0	28	0	0	0	0	28
Maxey Noded Redware	0	0	6	0	0	0	0	6
Bailey Engraved	0	0	4	1605	0	0	0	1609
Haley Engraved	0	0	25	0	13	40	0	79
Hodges Engraved	0	0	19	809	3	0	2	834
Hudson Engraved	12	0	860	823	15	800	0	2509
Simms Engraved	0	0	48	11	42	4800	0	4901
Friendship Engraved	0	0	5	43	0	0	0	48
Spiro Engraved	97	0	909	837	0	806	5	2653
Holly Fine Engraved	0	0	5	0	0	0	0	5
Crockett Curvilinear Incised	14	5	54	6	0	0	3	82
Pennington Punctate Incised	50	8	18	0	3	0	0	79
Canton Incised	86	0	184	495	44	11	11	829
Emory Punctate Incised	0	0	54	513	0	15	0	582
Harleton Applique	135	0	914	111	0	219	0	1379
Haley Complicated Incised	0	0	32	0	0	0	0	32
McKinney Plain	0	0	32	4577	0	800	0	3808
Military Road Incised	0	0	139	13	0	0	0	152
Dah-wat Incised	55	0	139	2767	1	1636	0	4598
Weches Incised Punctate	3	0	15	2	0	0	0	20

Table 5.24. Decorative types by temper (percent of estimated weight).

Decorative Type	Coarse Grog	Sand-Grog	Grog	Sand-Grit	Fine Sand	Shell	Bone	Total
Avery Engraved	0.00	0.00	0.74	0.00	0.19	99.07	0.00	100.00
Sanders Engraved	0.00	0.00	100.00	0.00	0.00	0.00	0.00	100.00
Maxey Noded Redware	0.00	0.00	100.00	0.00	0.00	0.00	0.00	100.00
Bailey Engraved	0.00	0.00	0.25	99.75	0.00	0.00	0.00	100.00
Haley Engraved	0.00	0.00	32.27	0.00	16.52	51.21	0.00	100.00
Hodges Engraved	0.00	0.00	2.30	97.05	0.37	0.00	0.28	100.00
Hudson Engraved	0.47	0.00	34.28	32.79	0.58	31.88	0.00	100.00
Simms Engraved	0.00	0.00	0.97	0.22	0.86	97.94	0.00	100.00
Friendship Engraved	0.00	0.00	10.27	89.73	0.00	0.00	0.00	100.00
Spiro Engraved	3.66	0.00	34.25	31.55	0.00	30.36	0.18	100.00
Holly Fine Engraved	0.00	0.00	100.00	0.00	0.00	0.00	0.00	100.00
Crockett Curvilinear Incised	17.25	6.20	65.86	7.17	0.00	0.00	3.52	100.00
Pennington Punctate Incised	63.66	9.91	23.13	0.00	3.30	0.00	0.00	100.00
Canton Incised	10.32	0.00	22.13	59.64	5.26	1.35	1.30	100.00
Emory Punctate Incised	0.00	0.00	9.19	88.19	0.00	2.61	0.00	100.00
Harleton Applique	9.82	0.00	66.28	8.02	0.00	15.89	0.00	100.00
Haley Complicated Incised	0.00	0.00	100.00	0.00	0.00	0.00	0.00	100.00
McKinney Plain	0.00	0.00	0.59	84.62	0.00	14.79	0.00	100.00
Military Road Incised	0.00	0.00	91.27	8.73	0.00	0.00	0.00	100.00
Dah-wat Incised	1.20	0.00	3.02	60.17	0.02	35.59	0.00	100.00
Weches Incised Punctate	15.42	0.00	73.13	11.44	0.00	0.00	0.00	100.00

Type 5.25. Decorative type-varieties by temper (by estimated weight in grams).

Decorative Types and Varieties	Coarse Grog	Sand-Grog	Grog	Sand-Grit	Fine Sand	Shell	Bone	Total
Avery Engraved chevron	0	0	0	0	0	1668	0	1668
Avery Engraved curvilinear	0	0	19	0	5	842	0	866
Maxey Noded Redware	0	0	6	0	0	0	0	6
Sanders Engraved	0	0	28	0	0	0	0	28
Bailey Engraved	0	0	4	1605	0	0	0	1609
Haley Engraved	0	0	25	0	13	40	0	79
Hodges Engraved	0	0	19	9	3	0	2	34
Hodges-Taylor Engraved	0	0	0	800	0	0	0	800
Hudson Engraved	12	0	860	823	15	800	0	2509
Friendship Engraved	0	0	5	43	0	0	0	48
Simms Engraved curvilinear	0	0	0	7	0	1600	0	1607
Simms Engraved rectilinear	0	0	48	4	42	3200	0	3294
Crockett Curvilinear Incised	14	5	54	6	0	0	3	82
Holly Fine Engraved	0	0	5	0	0	0	0	5
Pennington Punctate	0	8	15	0	0	0	0	23
Pennington Punctate Incised reed	50	0	3	0	3	0	0	56
Spiro Engraved	97	0	909	837	0	806	5	2653
Canton Incised plain	27	0	52	13	10	0	0	102
Canton Incised punctate	25	0	11	3	34	0	6	79
Canton Incised body	21	0	86	469	0	0	0	576
Canton Incised unclassified	12	0	35	10	0	11	5	73
Emory Punctate Incised rectilinear	0	0	54	481	0	14	0	548
Emory Punctate Incised curvilinear	0	0	0	33	0	2	0	34
Haley Complicated Incised	0	0	32	0	0	0	0	32
Harleton Applique chevron	135	0	901	84	0	219	0	1339
Harleton Applique vertical panel	0	0	14	26	0	0	0	40
McKinney Plain	0	0	32	4577	0	800	0	3808
Military Road Incised	0	0	139	13	0	0	0	152
Dah-wat Incised quadripartite	52	0	61	1941	1	1633	0	3687
Dah-wat Incised chevron	4	0	51	826	0	0	0	880
Dah-wat Incised diagonal intersect	0	0	18	0	0	4	0	22
Dah-wat Incised herringbone	0	0	9	0	0	0	0	9
Weches Incised Punctate	3	0	15	2	0	0	0	20

Type 5.26. Decorative type-varieties by temper (percent of estimated weight).

Decorative Types and Varieties	Coarse Grog	Sand-Grog	Grog	Sand-Grit	Fine Sand	Shell	Bone	Total
Avery Engraved chevron	0.00	0.00	0.00	0.00	0.00	100.00	0.00	100.00
Avery Engraved curvilinear	0.00	0.00	2.16	0.00	0.57	97.27	0.00	100.00
Maxey Noded Redware	0.00	0.00	100.00	0.00	0.00	0.00	0.00	100.00
Sanders Engraved	0.00	0.00	100.00	0.00	0.00	0.00	0.00	100.00
Bailey Engraved	0.00	0.00	0.25	99.75	0.00	0.00	0.00	100.00
Haley Engraved	0.00	0.00	32.27	0.00	16.52	51.21	0.00	100.00
Hodges Engraved	0.00	0.00	56.64	27.43	9.14	0.00	6.78	100.00
Hodges-Taylor Engraved	0.00	0.00	0.00	100.00	0.00	0.00	0.00	100.00
Hudson Engraved	0.47	0.00	34.28	32.79	0.58	31.88	0.00	100.00
Friendship Engraved	0.00	0.00	10.27	89.73	0.00	0.00	0.00	100.00
Simms Engraved curvilinear	0.00	0.00	0.00	0.44	0.00	99.56	0.00	100.00
Simms Engraved rectilinear	0.00	0.00	1.45	0.12	1.28	97.15	0.00	100.00
Crockett Curvilinear Incised	17.25	6.20	65.86	7.17	0.00	0.00	3.52	100.00
Holly Fine Engraved	0.00	0.00	100.00	0.00	0.00	0.00	0.00	100.00
Pennington Punctate	0.00	34.21	65.79	0.00	0.00	0.00	0.00	100.00
Pennington Punctate Incised reed	89.62	0.00	5.72	0.00	4.65	0.00	0.00	100.00
Spiro Engraved	3.66	0.00	34.25	31.55	0.00	30.36	0.18	100.00
Canton Incised plain	26.45	0.00	51.13	12.88	9.54	0.00	0.00	100.00
Canton Incised punctate	31.94	0.00	13.94	3.80	42.97	0.00	7.35	100.00
Canton Incised body	3.67	0.00	14.94	81.40	0.00	0.00	0.00	100.00
Canton Incised unclassified	16.99	0.00	47.26	13.56	0.00	15.34	6.85	100.00
Emory Punctate Incised rectilinear	0.00	0.00	9.77	87.73	0.00	2.50	0.00	100.00
Emory Punctate Incised curvilinear	0.00	0.00	0.00	95.60	0.00	4.40	0.00	100.00
Haley Complicated Incised	0.00	0.00	100.00	0.00	0.00	0.00	0.00	100.00
Harleton Applique chevron	10.11	0.00	67.24	6.29	0.00	16.37	0.00	100.00
Harleton Applique vertical panel	0.00	0.00	34.16	65.84	0.00	0.00	0.00	100.00
McKinney Plain	0.00	0.00	0.59	84.62	0.00	14.79	0.00	100.00
Military Road Incised	0.00	0.00	91.27	8.73	0.00	0.00	0.00	100.00
Dah-wat Incised quadripartite	1.40	0.00	1.66	52.64	0.02	44.28	0.00	100.00
Dah-wat Incised chevron	0.41	0.00	5.74	93.85	0.00	0.00	0.00	100.00
Dah-wat Incised diagonal intersect	0.00	0.00	82.57	0.00	0.00	17.43	0.00	100.00
Dah-wat Incised herringbone	0.00	0.00	100.00	0.00	0.00	0.00	0.00	100.00
Weches Incised Punctate	15.42	0.00	73.13	11.44	0.00	0.00	0.00	100.00

Table 5.27. Decorative types by vessel form (by count). This represents a partial sample

of each decorative type; not all sherds could be assigned a vessel type.

Decorative Type	Restricted Vessel	Jar	Simple Bowl	Carinated Bowl	Complex Carinated Bowl	Bottle	Complex Vessel	Total
Avery Engraved	0	1	3	1	1	0	0	6
Sanders Engraved	1	0	0	1	0	0	0	2
Maxey Noded Redware	0	0	0	0	0	0	0	0
Bailey Engraved	0	0	0	0	0	2	0	2
Haley Engraved	0	0	0	0	0	2	0	2
Hodges Engraved	0	0	0	0	0	0	1	1
Hudson Engraved	0	0	0	0	0	4	0	4
Simms Engraved	2	0	0	1	16	0	0	19
Friendship Engraved	0	0	0	0	2	0	0	2
Spiro Engraved	3	0	3	0	0	1	0	7
Holly Fine Engraved	0	0	0	0	1	0	0	1
Crockett Curvilinear Incised	0	1	0	1	0	0	0	2
Pennington Punctate Incised	0	0	0	0	0	0	0	0
Canton Incised	3	3	0	0	0	0	0	6
Emory Punctate Incised	4	2	0	0	0	0	0	6
Harleton Applique	1	4	0	0	0	0	0	5
Haley Complicated Incised	0	0	0	0	0	0	0	0
McKinney Plain	1	9	0	0	0	0	0	11
Military Road Incised	0	3	0	0	0	0	0	3
Dah-wat Incised	6	8	0	0	0	0	0	14
Weches Incised Punctate	1	0	0	0	0	0	0	1
Total	22	31	6	4	20	9	1	91

Modal Analysis of Decorative Attributes

Two decorative attributes, lip decoration and rim appliqué, are being analyzed modally to look for patterns that might cross-cut decorative types. Modal analysis of lip and rim attributes will be conducted in the forthcoming section describing vessel forms, because formation processes related to vessel shape likely strongly influenced these attributes.

Lip notching occurs on vessels at Woods, E. Johnson, Beaver, and Biggham Creek (Table 5.28). It is most common on carinated and complex carinated bowls including Friendship Engraved and Simms Engraved vessels (n=13), but it also occurs on some jars (n=6) including Dah-wat Incised vessels. Its presence on Simms Engraved and Dah-wat Incised vessels suggests that this attribute dates to a later period, perhaps after A.D. 1450/1500.

Table 5.28. Decorative types (named and descriptive) with notched lips by site.

Site	Friendship Engraved	Simms Engraved	Hudson Engraved	Trailed Incised unclass.	Dah-wat Incised	Neck-banded pinched unclass.	Neck-banded tool punctate unclass.	Unclass.	Total
Woods	1	0	0	0	0	1	0	0	2
E. Johnson	0	2	0	0	2	1	0	2	7
Beaver	0	3	0	0	1	0	0	2	6
Biggham Creek	0	7	1	1	0	0	1	2	12
Total	1	12	1	1	3	2	1	6	27

Appliqué present on vessel rims in the Mountain Fork assemblages includes nodes, ridges, pseudo-handles, and strap handles. No loop handles have been recorded. All of these forms of rim appliqué occur almost exclusively on jars and always on utility wares. No other particular patterns are detectable regarding their distribution among sites or different decorative types (Tables 5.29 and 5.30).

Table 5.29. Rim appliqué present at each site.

Site	Node (n)	Ridge (n)	Pseudo-handle (n)	Strap handle(n)
Ramos Creek	1	0	2	1
Woods	10	0	4	0
Hughes	1	0	0	2
E. Johnson	9	1	0	3
Beaver	10	2	4	3
Biggham Creek	6	0	2	1

Table 5.30. Decorative types (named and descriptive) with rim appliqué.

Type	Node (n)	Ridge (n)	Pseudo-handle (n)	Strap handle (n)
Emory Punctate Incised	0	0	0	1
Dah-wat Incised	3	0	1	0
Haley Complicated Incised	0	0	0	1
Harleton Applique	1	0	0	1
McKinney Plain	4	1	1	0
Neck-banded pinched unclass.	2	0	2	1
Neck-banded pinched-punctate unclass.	0	0	0	0
Neck-banded punctate unclass.	6	0	0	0

Vessel Forms

Vessel forms present in the Mountain Fork assemblages include unclassified restricted vessels, jars, simple bowls, carinated bowls, bottles, and one compound vessel. Rim attributes, neck attributes, and sometimes decorative attributes were used to identify vessel form. In the tally of vessel forms at each site, however, only sherds with both measurable rim diameters and form diagnostic attributes were counted (Tables 5.31, 5.32, and 5.33). This was done in order to obtain a more accurate count of unique vessels, by avoiding neck sherds only identified as jars through the presence of neck-banding. Even so, jars are probably disproportionately represented because of their highly recognizable rims. This overrepresentation should occur equally at all sites, though, because of the regularity of neck-banded vessels throughout this time period, and so should not affect comparisons of vessel representation between sites. For describing each vessel form, though, the higher counts including all identifiable examples of vessel forms will be used.

Table 5.31. Vessel forms identified at each site (count). Only whole vessels and sherds with both a measurable rim diameter and form-diagnostic attributes are counted.

Site	Restricted Vessel	Jar	Simple Bowl	Carinated Bowl	Complex Carinated Bowl	Bottle	Total
Ramos Creek	1	5	0	1	2	4	13
Woods	1	35	3	0	3	1	43
Hughes	1	7	1	1	0	0	10
E. Johnson	2	20	12	5	4	7	50
Beaver	13	37	14	9	9	19	101
Biggham Creek	2	15	6	4	7	2	36
Total	20	119	36	20	25	33	253

Table 5.32. Vessel forms identified at each site (proportion of assemblage). Only whole

vessels and sherds with both a measurable rim diameter and form-diagnostic attributes are counted.

Site	Restricted Vessel	Jar	Simple Bowl	Carinated Bowl	Complex Carinated Bowl	Bottle	Total
Ramos Creek	7.69	38.46	0.00	7.69	15.38	30.77	100.00
Woods	2.33	81.40	6.98	0.00	6.98	2.33	100.00
Hughes	10.00	70.00	10.00	10.00	0.00	0.00	100.00
E. Johnson	4.00	40.00	24.00	10.00	8.00	14.00	100.00
Beaver	12.87	36.63	13.86	8.91	8.91	18.81	100.00
Biggham Creek	5.56	41.67	16.67	11.11	19.44	5.56	100.00

Table 5.33. Distribution of whole vessels by form and site.

Count	Jar	Simple Bowl	Carinated Bowl	Complex Carinated Bowl	Bottle	Compound Vessel	Total
E. Johnson	8	1	3	3	2	1	18
Beaver	7	5	2	6	4	0	24
Biggham Creek	0	0	0	0	1	0	1
Total	15	6	5	9	7	1	43

In general, most of the assemblages are (as expected) dominated by jars, with proportions ranging from 37 to 81 percent of identified vessel types. Interestingly, the two mound sites have very different proportions of jars: 81 percent at Woods versus 42 percent at Biggham Creek. Not unexpectedly, this correlates with the much higher ratio of fine to utility decorated wares at Biggham Creek (0.32) versus Woods (0.04). Among the decorative types, all of the utility wares are jars and unclassified restricted vessels, whereas fine wares are mainly bowls and bottles. However, the fine to utility ware ratio may not account for all the difference. The proportion of jars at Biggham Creek is quite similar to the proportions at Ramos Creek, E. Johnson, and Beaver, even though Biggham Creek has a much higher fine to utility decorated ware ratio than these other three sites. Woods stands out both for its low proportion of fine decorated wares and for its high proportion of jars, whereas Biggham only stands out for its high proportion of fine decorated wares.

Jars. To more fully describe the characteristics of jars in the Mountain Fork assemblages, this sample consists of whole vessels and all sherds identifiable as jars (n=335, including 15 whole vessels). To analyze rim and lip attributes only rim sherds were used. Most of the jars (62 percent by weight) are tempered with sand-grit, followed by shell (21 percent) and grog (14 percent) (Table 5.34). Regarding surface treatment, most of the jars (90 percent) are classified as utility decorated (Table 5.35). Thickness ranges from 3.9 to 11.2 mm with a mean of 6.0 mm (Figure).

Table 5.34. Temper of jars (by estimated weight in grams).

Temper	Count	Proportion
Coarse Grog	469	2.56
Grog	2625	14.28
Sand-Grit	11313	61.52
Fine Sand	53	0.29
Shell	3928	21.36
Total	18388	100.00

Table 5.35. Surface treatment of jars.

Surface Treatment	Count	Proportion
Decorated unclassified	3	0.89
Fine Decorated	4	1.19
Utility Decorated	304	90.21
Burnished	1	0.30
Plain	25	7.42
Total	337	100.00

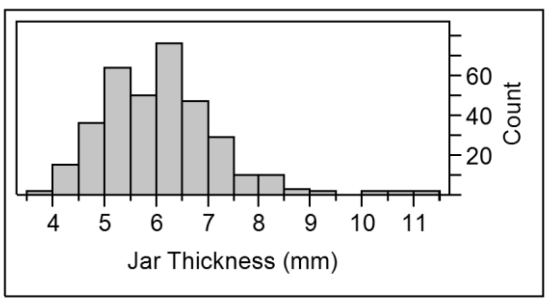


Figure 5.53. Distribution of thickness (mm) for jars (n=335).

Regarding rim and lip attributes of jars, the only attribute that varied much between sites was rim treatment (Table 5.36). Most of the rims were plain. Castellated jar rims were infrequent in the Mountain Fork assemblage overall and only occurred at Woods (n=5) and Beaver (n=5). This confirms an early comparison (Dowd 2011c:Table 6.11) between whole vessels from the Mountain Fork assemblages and the McDonald site along the Glover River in which a low incidence of castellated rims was noted for the Mountain Fork assemblages (one castellated jar at the Beaver site versus 24 castellated jars at McDonald). Scalloped jar rims were even rarer (n=2) and only occurred at Hughes.

Table 5.36. Rim treatment of jars by site.

Site	Castellated	Plain	Scalloped	Total
Ramos Creek	0	6	0	6
Woods	5	33	0	38
Hughes	0	6	2	8
E. Johnson	0	23	0	23
Beaver	5	42	0	47
Biggham Creek	0	15	0	15
Total	10	125	2	137

Orifice diameter for jars ranged from 9 to 40 cm with an overall average of 21.2 cm (n=119). The distribution was bimodal, but no patterns that might explain those modes could be detected (Figure 5.54). Modal peaks occurred from 12.5 and 15 cm and from 20 to 25 cm. When comparing mean orifice diameters, Ramos Creek had the largest mean (26.0 cm, n=5) followed by Woods (23.8, n=35) and Hughes (23.7, n=7), and then by Biggham Creek (n=20.1, n=15), Beaver (19.2, n=37), and E. Johnson (19.1, n=20) (Figure 5.55).

First a non-parametric Wilcoxon/Kruskal-Wallis test was conducted to compare the mean diameters between all the sites. The non-parametric Wilcoxon test is probably preferable to a standard ANOVA if comparing all the means because some of the sample sizes were very low. The results showed that the difference in mean diameter between at least two of the sites was not very significant (p=0.129) because it was not below the standard threshold of p=.05. Phrased another way, the test said that there is a 12.9% chance that the differences in mean orifice diameters between the sites can be attributed to random chance alone. When the analysis was followed up with a Tukey HSD test to find out which pairs of samples were most different, I found that the most potential difference existed between Woods and Beaver (p=0.0558). In other words, the test said there is only a 5.58% chance that the differences in mean jar diameters between Woods and Beaver can be attributed to random chance alone. This difference was fairly significant, although again not below the standard threshold of p=.05.

Next the samples from Ramos Creek and Hughes were excluded because of the low sample sizes in order to conduct a standard ANOVA. The results showed that the difference in mean diameter between at least two of the sites was significant (p=0.02). Phrased another way, the test said that there is only a 2% chance that the differences in mean orifice diameters between at least two of the sites can be attributed to random chance alone. When the analysis was followed up with a Tukey HSD test to find out which pairs of samples were significantly different, I again found that the only significant difference existed between Woods and Beaver (p=0.0248). In other words, the test said there is only a 2.48% chance that the differences in mean jar diameters between Woods and Beaver can be attributed to random chance alone. Among the sites with larger samples, it is potentially meaningful that larger jars were present at Woods than at the other sites. Larger cooking vessels could indicate that larger groups were gathering for meals in this locality.

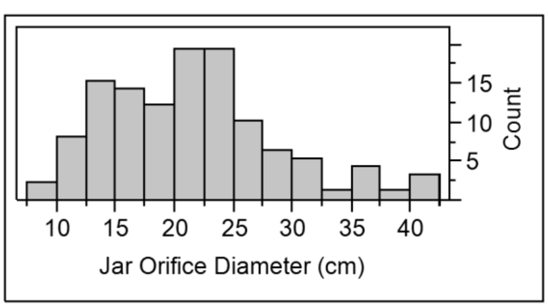


Figure 5.54. Orifice diameter (cm) of jar rims (n=119).

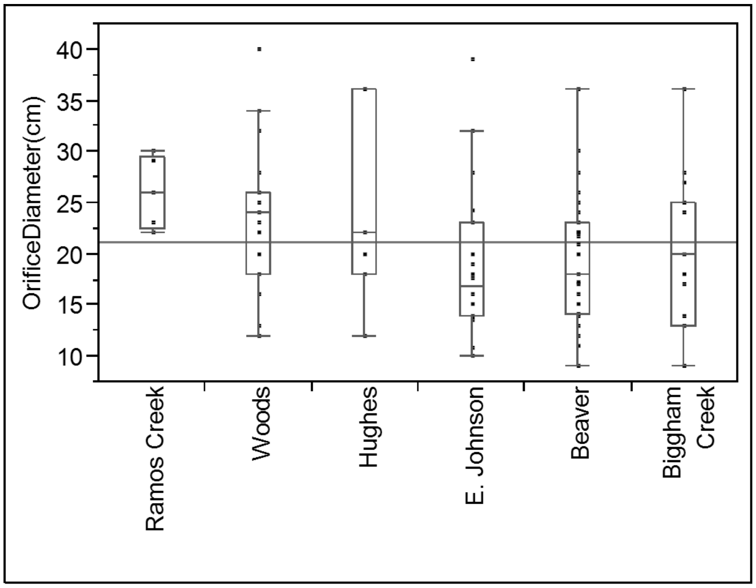


Figure 5.55. Distribution of orifice diameters (cm) among jars by site, with box-and-whisker plots showing site means and first and second standard deviations. The horizontal line is the overall mean. Excluding sites with low sample size (Ramos Creek and Hughes), Woods has both the largest mean orifice diameter (23.8 cm) and the single jar with the greatest orifice diameter (40 cm).

Simple Bowls. The Mountain Fork assemblages contained segments of 38 identifiable simple bowls, including six whole vessels. By weight, most of the simple bowls were tempered with sand-grit (47 percent) or shell (44 percent) (Table 5.37). While most of the simple bowl fragments were plain (63 percent), a fairly high number were classified as fine decorated wares (21 percent) (Table 5.38). This count includes two shell-tempered Avery Engraved vessels and two Spiro Engraved vessels (one shell-tempered and one sand-grit tempered). The other two whole vessels are tempered with sand-grit. Both Spiro Engraved simple bowls from Burials 2 and 4 at Beaver have rim tabs, which are characteristic of Harlan phase assemblages from around A.D. 1100 to 1250 (Brown 1996:Figures 1-48 and 1-51).

Table 5.37. Temper of simple bowls (by estimated weight in grams).

Temper	Count	Proportion
Coarse Grog	115	2.03
Grog	271	4.79
Sand-Grit	2634	46.60
Fine Sand	89	1.57
Shell	2473	43.74
Bone	71	1.26
Total	5653	100.00

Table 5.38. Surface treatment of simple bowls.

Surface Treatment	Count	Proportion
Fine Decorated	8	21.05
Utility Decorated	2	5.26
Red Plain	2	5.26
Burnished	2	5.26
Plain	24	63.16
Total	38	100.00

Thickness of simple bowls ranges from 3.4 to 10.7 mm with a mean of 6.4 mm (Figure 5.56). The orifice diameters range from 8 to 30 cm with a mean of 19.4 cm (n=36). The distribution of orifice diameters appears potentially tri-modal, with one peak from 10-12.5 cm, another from 15-17.5 cm, and a third from 25 to 27.5 cm (Figure 5.57). No other patterns are evident in relation to these modes, though, although I investigated whether particular decorative types occurred more frequently within each mode.

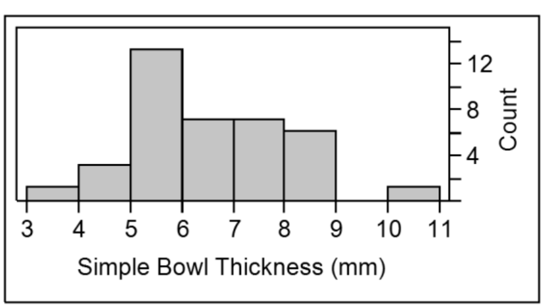


Figure 5.56. Thickness (mm) of simple bowls, excluding bases (n=38).

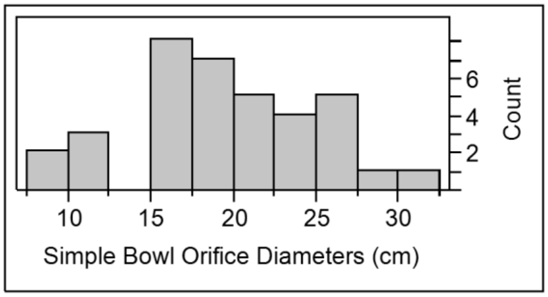


Figure 5.57. Orifice diameter (cm) of simple bowls (n=36).

Carinated Bowls. The Mountain Fork assemblages contain 22 examples of carinated bowls, including 5 whole vessels. Most are tempered with either sand-grit (58 percent by weight) or shell (39 percent; Table 5.39). Surface treatment is distributed rather evenly: 18 percent fine decorated, 14 percent utility decorated, 9 percent red slipped plain, 18 percent burnished, and 41 percent plain (Table 5.40). Thickness ranges from 4 to 7.6 mm with a mean of 5.8 mm (Figure 5.58).

Table 5.39. Temper of carinated bowls.

Temper	Count	Proportion
Coarse Grog	44	1.05
Grog	98	2.34
Sand-Grit	2407	57.58
Shell	1631	39.02
Total	4180	100.00

Table 5.40. Surface treatment of carinated bowls.

Surface treatment	Count	Proportion
Fine Decorated	4	18.18
Utility Decorated	3	13.64
Red Plain	2	9.09
Burnished	4	18.18
Plain	9	40.91
Total	22	100.00

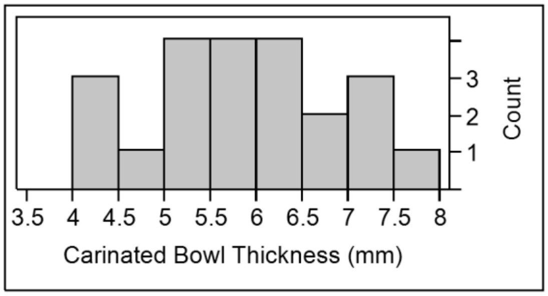


Figure 5.58. Thickness (mm) of carinated bowls, excluding bases (n=22).

The orifice diameters of the carinated bowls range from 11.8 to 33.2 cm with a mean of 20.6 cm (n=20). Within the distribution, however, three modes are clearly present (Figure 5.59). Orifice diameters in the first mode range from 11.8 to 16 cm. This mode includes 4 plain carinated bowls, 2 burnished, 1 pinched, and 1 Crockett Curvilinear Incised. The second mode includes carinated bowls with orifice diameters ranging from 20 to 26 cm, with 3 red slipped plain, 1 Avery Engraved, 2 burnished, 1 plain, 1 pinched, and 1 lip notched unclassified. Lastly, the third mode has rim diameters ranging from 32 to 33.2 cm and includes 2 plain vessels from Burial 5 at E. Johnson and 1 Simms Engraved vessel from Biggham Creek. The Simms Engraved vessel (*cat. 16.15*) is somewhat irregular, in that its rim profile is similar to that of a complex carinated bowl, but with no defined point of inflection between the upper and lower rim panels.

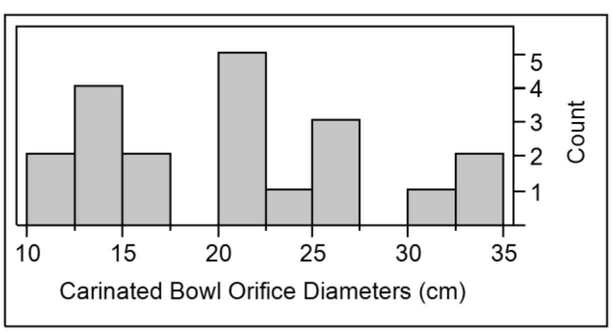


Figure 5.59. Orifice diameter (cm) of carinated bowls (n=20).

Most of the carinated bowls have plain rims, but two of the rims are scalloped. The two with scalloped rims include a curvilinear Avery Engraved vessel from Biggham Creek and an un-typed vessel with lip notching from E. Johnson.

Complex Carinated Bowls. The Mountain Fork assemblages contain 33 examples of complex carinated bowls, including 9 whole vessels. Most of these are tempered with shell (86 percent by weight) followed by sand-grit (13 percent) (Table 5.41). The high proportion of shell reflects the large number of Simms Engraved complex carinated bowls, which date to the later part of the Caddo period. Surface treatment is dominated by fine decorated wares (73 percent), followed by plain treatment (18 percent), and then red slipped plain (9 percent; Table 5.42).

Table 5.41. Temper of complex carinated bowls (by estimated weight in grams).

Temper	Count	Proportion
Coarse Grog	2	0.03
Grog	42	0.64
Sand-Grit	861	13.16
Fine Sand	39	0.60
Shell	5600	85.58
Total	6544	100.00

Table 5.42. Surface treatment of complex carinated bowls.

Surface Treatment	Count	Proportion
Fine Decorated	24	72.73
Red Plain	3	9.09
Plain	6	18.18
Total	33	100.00

Thickness of complex carinated bowls ranges from 3.3 to 6.1 mm with a mean of 4.6 mm (Figure 5.60). Orifice diameters range from 6 cm to 37 cm with a mean of 19.6 cm (n=25; Figure 5.61). Two modes are apparent, the first ranging from 6 to 22 cm and the second ranging from 30 to 37 cm. No other differences are readily apparent between these two modes.

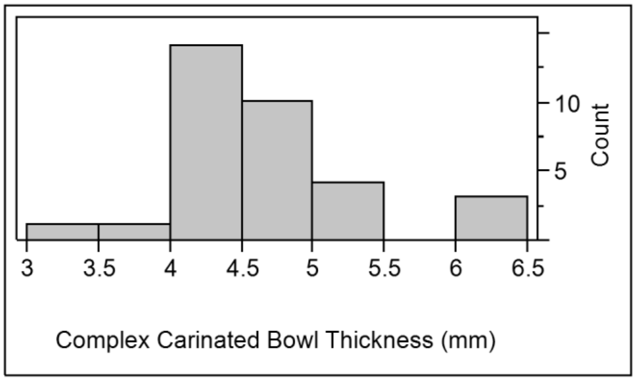


Figure 5.60. Thickness (mm) of complex carinated bowls, excluding base sherds (n=33).

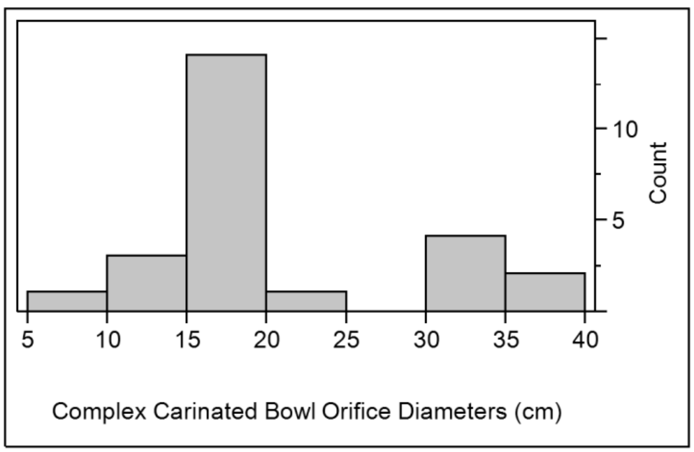


Figure. 5.61 Orifice diameter (cm) of complex carinated bowls (n=25).

Bottles. In the Mountain Fork assemblages 48 examples of bottles are present, including 7 whole vessels. Most are tempered with grog (41 percent by weight) or sand-grit (40 percent), followed by shell (14 percent; Table 5.43). Surface treatment is somewhat difficult to discern when only the rim of the bottle is present, because all decoration is on the body of the vessel. Despite this, fine decorated wares still comprise 23 percent of the assemblage (Table 5.44).

Table 5.43. Temper of bottles (by estimated weight in grams).

Temper	Count	Proportion
Coarse Grog	18	0.30
Grog	2509	41.43
Sand-Grit	2445	40.37
Fine Sand	248	4.10
Shell	834	13.77
Bone	2	0.03
Total	6056	100.00

Table 5.44. Surface treatment of bottles.

Surface Treatment	Count	Proportion
Fine Decorated	11	22.92
Utility Decorated	2	4.17
Red Plain	8	16.67
Burnished	1	2.08
Plain	26	54.17
Total	48	100.00

Bottle thicknesses range from 2.8 to 8.6 mm with a mean of 5.5 mm (Figure 5.62).

Orifice diameters range from 4 to 9 cm with a mean of 5.4 cm (n=33) (Figure 5.63).

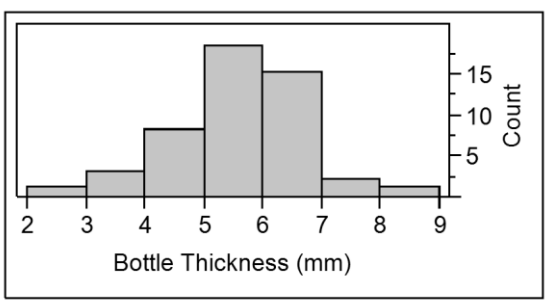


Figure 5.62. Thickness (mm) of bottles, excluding bases (n=48).

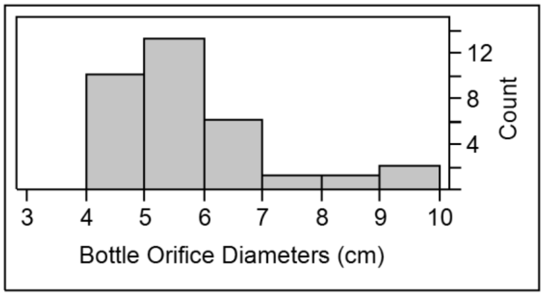


Figure 5.63. Orifice diameter (cm) of bottles (n=33).

Summary

In this chapter I analyzed the overall character of the Mountain Fork pottery assemblage, described the decorative types present at each site, examined some modal attributes, and described the vessel forms present within the assemblages. Pottery decorative types and forms, especially among jars, displayed the most patterned variation between sites. This stylistic variation will be used in the next chapter to address the social history of the Mountain Fork Caddo communities through an examination of chronology, social identity, and the character of the two mound sites.

Chapter 6: Chronology, Social Identity, and Mound Site Pottery

This chapter draws heavily on the proceeding pottery analysis in conjunction with other data to address three main research questions about the archaeological history of the Mountain Fork Caddo. First, the chronology of site occupation is examined using temporally diagnostic vessel forms and decorative styles together with a series of radiocarbon dates. Second, decorative styles are used to explore the social relationships among the Mountain Fork communities and with nearby regions in order to address both social integration and social connections. Third, the character of the two Mountain Fork mound sites, Woods and Biggham Creek, is investigated in relation to variation between the sites' pottery assemblages, including differences in vessel forms, sizes, and decorative styles. Identifying the distinctions between these sites is critical for interpreting their roles in the socio-political dynamics of this valley.

Chronology

The first research question I will address with the pottery data is the chronology of the major site occupations along the Mountain Fork. Archaeological attempts to figure out the spatial-temporal framework of the Caddo area began in the 1940s with a major publication by Alex Krieger (1946). In this publication, Krieger attempted to date Caddo sites by comparing pottery-making agricultural societies from the Southwest, across the Plains, and into the Lower Mississippi Valley. Based on similarities in pottery attributes, especially neck-banding and forms, between Caddoan and Puebloan sites and on the presence of trade goods, he was able to divide the Caddo area material assemblages into an earlier Gibson aspect and a later Fulton aspect. Krieger placed the Gibson/Fulton divide around A.D. 1400/1500. Although this date foreshortened the chronology of the Caddo area to a degree, it was remarkably accurate considering the no radiocarbon dates were available at the time. Using the McKern (1939) Midwestern Taxonomic System, Krieger identified a number of more limited cultural foci within each of the two aspects, making significant progress towards organizing a framework for studying the Caddo area.

As archaeologists working in the Caddo area began to accumulate radiocarbon dates from secure proveniences, they were able to develop much better regional chronologies. In the 1960s they also began gradually switching over to the system of taxonomic classification proposed by Willey and Phillips (1958). Several archaeologists developed a number of pan-areal periods for comparative purposes, although some of periods reflected stylistic pottery horizons more than similar forms of cultural adaptation (Davis 1970; Story 1990; Wyckoff 1971; see Perttula 1996 for elaboration on this issue). A number of regional chronologies developed during this time did reflect meaningful cultural continuities and changes, though. Archaeologists who developed these regional phase chronologies include Wyckoff (1980) and Bell (1984) for the Arkansas valley; Wyckoff and Fisher (1985) for the McCurtain phase; Story (1997) based on her 1968-1970 work at the George C. Davis site in northeast Texas; Webb and McKinney (1975) based on their work at Mounds Plantation in Louisiana along the Red River; Bohannon (1973) based on his work at Mineral Springs along the Saline River in southwestern Arkansas; Hoffman (1969) based on his work along the lower Little River in southwestern Arkansas; Early (2002a-d) based on research in the Middle Ouachita Valley; and Early (1981, 1988) based on her work and Wood's (1981) work in the Upper Ouachita Valley. Caddo archaeologists have continued to use radiocarbon dates, archaeomagnetic dates, pottery seriation, and other chronologically-sensitive artifacts to refine regional chronologies to reflect meaningful change over time and spatial variation (Brown 1996; Bruseth 1998; Corbin and Hart 1998; Early 1988, 1993, 2002; Perttula 1998, 2008; Rogers 1995; Schambach 1982). These regional phases encompass both formal content, defined geographic distribution, and defined temporal duration (Willey and Phillips 1958:22).

The most current periods in use across the Caddo area are either those described by Story (1990) or those more specific to the southern Caddo area described by Early (1982) which each divide late prehistoric archaeology in the Caddo area up into early, middle, and late periods. This project will refer most often to Early's (1982) designations of Early Caddo (A.D. 1000-1300), Middle Caddo (A.D. 1300-1450/1500), and Late Caddo (A.D. 1450/1500-1700). Based on our current understanding of chronology across the Caddo area, these periods fit the material evidence for cultural transitions much better than the original Caddo I-V periods developed by Davis in 1969 (Ann Early, personal comm. 2012). Table 6.1 outlines phase designations for some of the regions with which the Mountain Fork Caddo may have interacted, based on the occurrence of diagnostic pottery.

Table 6.1. Chronological periods and cultural phases in the Caddo area (1-Story 1990; 2-Brown 1996; 3- Bruseth 1998, Perttula 2008; 4-Schambach 1982; 5-Hoffman 1969, 1970, 1971; 6-Bohannon 1973; 7-Early 1981; 8-Early 2002a-d; 9-Early 1982). This list is not comprehensive for the Caddo area but deals specifically with regions to which the Mountain Fork Caddo may have had ties.

A.D.	Pan-Caddo Area periods[1]	Arkansas Valley (grave periods)[2]	Arkansas Valley (phases)[2]	Middle Red River phases[3]	Great Bend of the Red River phases[4]	Lower Little River phases[5]	Mineral Springs components (approximate)[6]	Upper Ouachita River phases[7]	Middle Ouachita River phases[8]	Ouachita Mountains periods[9]	A.D.
1800	Historic Caddo			Historic Caddo	Chakanina						1800
1700	Late Caddo			Late McCurtain	Texarkana/ Belcher				Deceiper	Late Caddo	1700
1650									Social Hill		1650
1600											1600
1500			Fort Coffee	Early McCurtain	uncertain	Saratoga	Mineral Springs V Mineral Springs V	Buckville	Mid-Ouachita	Middle Caddo	1500
1450		Spiro IV	Spiro								1450
1400	Middle Caddo				Haley	Mineral Springs	Mineral Springs IV		East (to 1340/ 1400)		1400
1350		Spiro III	Norman								1350
1300				Mound Prairie / Sanders		Graves Chapel	Mineral Springs II			Early Caddo	1300
1250		Spiro II	Harlan								1250
1200	Early Caddo				Lost Prairie		Mineral Springs II				1200
1150						Millers Crossing					1150
1100		Spiro I	Evans	Albion							1100
1000	Formative Caddo										1000
900											900
800											800

Establishing chronological relationships between the Mountain Fork sites is important for several reasons. First, it is necessary in order to understand the history of this valley, including when certain places on the landscape were occupied and the duration of those occupations. Identifying trends and shifts in occupation are prerequisite to discovering the potential environmental, economic, social, and political reasons for longevity of occupation in some cases and movement across the landscape in others.

Contemporaneity of site occupation must be established independently before pottery styles from those sites can be used as proxies for social relationships. Otherwise it is difficult to tell whether similar pottery styles at two sites means that those communities were socially related or whether they represent a single community that got up and moved along the river to a new location. That sort of move might be expected for a group practicing small-scale horticulture as the Mountain Fork Caddo evidently did. Finally, elucidating the valley's chronology also assists in exploring the relationship of these communities to broader changes, processual and historical, across the Caddo area. Exact dates can be difficult to establish for archaeological sites, but at least establishing approximate ranges of occupation is necessary before postulating relationships between communities, both within the Mountain Fork and with those in other regions.

Although a number of techniques exist for determining the period of site occupation, this analysis relies primarily on radiocarbon dates. Five of the six sites under investigation were excavated in the 1960s and fortunately charcoal and some soil samples were taken at the time and remain in the collections. Most of these samples were not submitted for radiocarbon dating at that time, because a much larger amount of organic material was necessary than today for acquiring a date. Eight dates were acquired in the 1960s, however; four from Woods Mound Group, two from Hughes, and two from Beaver. An NSF grant for this project and funding from the SRI Foundation provided funding for 25 more radiocarbon and AMS dates from both existing collections and new excavations, including 13 from the Ramos Creek excavations, one from Hughes, three from E. Johnson, four from Beaver, and four from Biggham Creek. Three more dates from Woods Mound Group were obtained with funding provided by Don Wyckoff. One date from Ramos Creek was funded by the Oklahoma Archeological Survey. For all six sites we now have a total of 37 radiocarbon dates (17 standard radiometric and 20 AMS). In terms of site distribution, Ramos Creek has 14 dates, Hughes has 3, Woods has 7, E. Johnson has 3, Beaver has 6, and Biggham Creek has 4.[4]

Three of these dates are not reliable, with probability ranges extending into the twentieth century, and probably resulted from sample contamination. These include one date from Woods Mound Group (TX-491, Mound BB), Biggham Creek (AA93092), and E. Johnson (AA93086). This leaves 34 useful radiocarbon dates for these Mountain Fork sites (Figure 6.1, Table 6.2).

[4] For radiocarbon dates from additional sites along the Mountain Fork see Appendices D and E. For a series of Oxidizable Carbon Ratio (OCR) date analyses from 34Mc402, 34Mc838, and 34Mc848 see Pertula and Nelson 2004:Appendix 5.

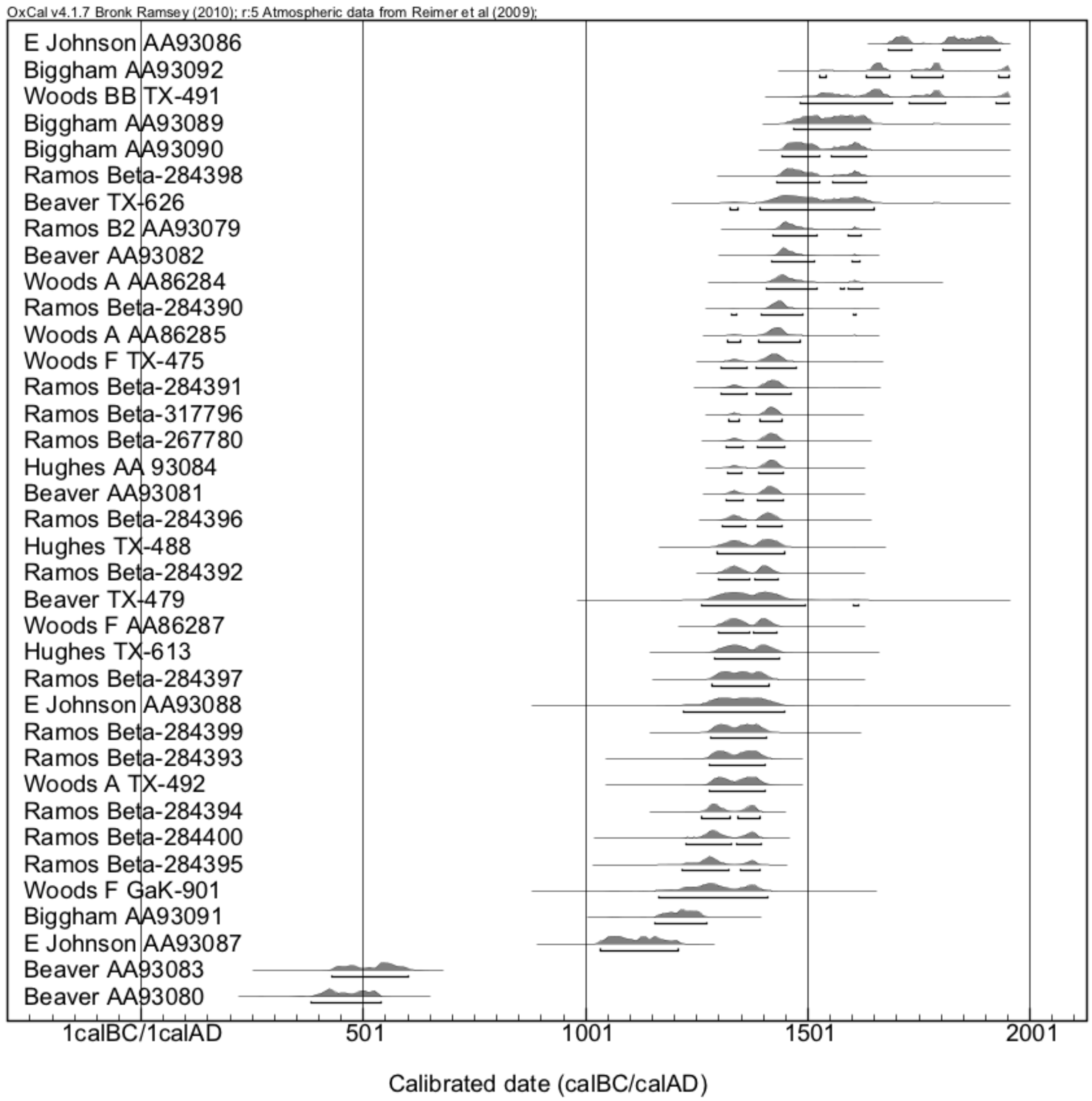


Figure 6.1. Two-sigma calibrated dates from the sites along the Mountain Fork (cal. 2-sigma; Bronk Ramsey 2009, calibrated with OxCal 4.1 using IntCal 09 calibration curve).

Table 6.2. Radiocarbon dates from study sites along the Mountain Fork.

Site Name	Site #	Lab #	AMS or Radiometric	Conventional Radiocarbon Age (BP)	13C/12C Ratio	2 Sigma Calibration (AD)*	Provenience and Material
Ramos Creek	34MC1030	Beta-284398	Radiometric	400 ± 40	-25.7 o/oo	1432-1527 or 1556-1633	Block 1 Structure, 26-30 cmbd, charred timber
Ramos Creek	34MC1030	AA93079	AMS	421 ± 33	-27.2 o/oo	1421-1521 and 1592-1620	Block 2, Pit (F5), charcoal
Ramos Creek	34MC1030	Beta-284390	AMS	470 ± 40	-27.9 o/oo	1330-1339 or 1396-1489 or 1604-1608	Block 1 Structure, 34 cmbd, post hole
Ramos Creek	34MC1030	Beta-284391	Radiometric	510 ± 50	-27.1 o/oo	1305-1364 or 1384-1463	Block 1 Structure, charred timber
Ramos Creek	34MC1030	Beta-317796	AMS	520 ± 30	-10.4 o/oo	1330-1340 and 1400-1440	Block 1 Structure, 30-35 cmbd, charred maize cupule
Ramos Creek	34MC1030	Beta-267780	AMS	520 ± 40	-25.8 o/oo	1316-1356 or 1388-1448	Block 1 Structure, 30-35 cmbd, charcoal
Ramos Creek	34MC1030	Beta-284396	Radiometric	540 ± 40	-26.3 o/oo	1307-1362 or 1386-1442	Block 1 Structure, 20-24 cmbd, charred timber
Ramos Creek	34MC1030	Beta-284392	AMS	560 ± 40	-26.8 o/oo	1300-1369 or 1381-1435	Block 1 Structure, 33 cmbd, post hole
Ramos Creek	34MC1030	Beta-284397	Radiometric	610 ± 50	-27.1 o/oo	1285-1414	Block 1 Structure, 20-25 cmbd, charred timber
Ramos Creek	34MC1030	Beta-284399	Radiometric	630 ± 50	-26.1 o/oo	1281-1409	Block 1 Structure, 33 cmbd, post hole (F12)
Ramos Creek	34MC1030	Beta-284393	Radiometric	640 ± 50	-25.6 o/oo	1278-1405	Block 1 Structure, 20-25 cmbd, charred timber
Ramos Creek	34MC1030	Beta-284394	Radiometric	680 ± 40	-25.6 o/oo	1263-1325 and 1344-1394	Block 1 Structure, 21-24 cmbd, charred timber
Ramos Creek	34MC1030	Beta-284400	Radiometric	690 ± 50	-26.2 o/oo	1226-1330 and 1339-1397	Block 1 Structure, 50 cmbd, post hole (F11)
Ramos Creek	34MC1030	Beta-284395	Radiometric	710 ± 50	-25.9 o/oo	1219-1322 and 1349-1392	Block 1 Structure, 20-24 cmbd, charred timber

Table 6.2 (continued). Radiocarbon dates from study sites along the Mountain Fork.

Site Name	Site #	Lab #	AMS or Radiometric	Conventional Radiocarbon Age (BP)	13C/12C Ratio	2 Sigma Calibration (AD)*	Provenience
Woods	34MC104	TX-475	Radiometric	500 ± 50		1306-1363 or 1385-1476	Mound F, post 13
Woods	34MC104	AA86287	AMS	568 ± 43	-24.4 o/oo	1299-1370 or 1380-1431	Mound F, Level 2, charred post
Woods	34MC104	GaK-901	Radiometric	710 ± 80		1164-1410	Mound F, charred post (Post 25)
Woods	34MC104	AA86284	AMS	443 ± 43	-27.0 o/oo	1406-1522 or 1575-1583 or 1591-1623	Mound A, charred post (Post 10)
Woods	34MC104	AA86285	AMS	484 ± 44	-25.4 o/oo	1320-1350 or 1391-1485	Mound A, D10", possibly charred post
Woods	34MC104	TX-492	Radiometric	640 ± 50		1278-1405	Mound A, Feature 1
Woods	34MC104	TX-491	Radiometric	250 ± 50		1482-1690 or 1729-1810 or 1925-1955	Mound BB
Hughes	34MC21	AA93084	AMS	520 ± 34	-25.5 o/oo	1320-1351 or 1391-1445	Pit (F2 (?)), charcoal
Hughes	34MC21	TX-488	Radiometric	540 ± 60		1296-1448	Pit (F2)
Hughes	34MC21	TX-613	Radiometric	570 ± 60		1292-1436	Pit (F2)
E. Johnson	34MC54	AA93086	AMS	89 ± 33	-29.3 o/oo	--	Unknown provenience, charcoal
E. Johnson	34MC54	AA93088	AMS	619 ± 94	-26.2 o/oo	1222-1447	Grid C O:O, D16", charcoal
E. Johnson	34MC54	AA93087	AMS	907 ± 34	-26.5 o/oo	1035-1209	Grid C O:O, D25", charcoal
Beaver	34MC1	TX-626	Radiometric	420 ± 80		1326-1344 or 1394-1649	Feature 3, charcoal

Table 6.2 (continued). Radiocarbon dates from study sites along the Mountain Fork.

Site Name	Site #	Lab #	AMS or Radiometric	Conventional Radiocarbon Age (BP)	13C/12C Ratio	2 Sigma Calibration (AD)*	Provenience
Beaver	34MC54	AA93082	AMS	429 ± 33	-26.4 o/oo	1419-1515 or 1600-1618	N3:L4 Lev2, charcoal
Beaver	34MC54	AA93081	AMS	527 ± 36	-25.7 o/oo	1316-1355 or 1388-1444	Structure 3 or Feature 3, charcoal
Beaver	34MC54	TX-479	Radiometric	560 ± 90		1263-1495 or 1602-1616	Structure 3, charcoal
Beaver	34MC54	AA93083	AMS	1529 ± 35	-25.0 o/oo	431-603	N7:L3 D12", F3 or 1?, charcoal
Beaver	34MC54	AA93080	AMS	1613 ± 33	-25.0 o/oo	384-542	N7:L2 D17", 34" S of N8:L3, charcoal
Biggham Creek	34MC105	AA93092	AMS	230 ± 33	-25.8 o/oo	1529-1542 or 1634-1684 or 1735-1806 or 1930-1955	Mound A, D11.5", charcoal
Biggham Creek	34MC105	AA93089	AMS	339 ± 34	-26.9 o/oo	1468-1641	Mound A, Level 2, charcoal
Biggham Creek	34MC105	AA93090	AMS	377 ± 34	-25.1 o/oo	1444-1528 or 1552-1634	Mound A, Level 4, charcoal
Biggham Creek	34MC105	AA93091	AMS	826 ± 34	-25.8 o/oo	1156-1273	Mound A, D 11", charcoal

*Calibrated with IntCal09 curve using OxCal 4.1 (Bronk Ramsey 2009).

Although the radiocarbon dates are useful, they came from a few contexts at each site and may not reflect the entirety of occupation. Some pottery types and forms from surrounding regions are chronologically sensitive and helpful for refining ranges of site occupation (Figure 6.2). The diversity of decorative types present within the fine ware and utility ware categories is also helpful for estimating the relative lengths of occupation for each site. Chronologically sensitive types pertinent to this analysis include Spiro Engraved, Holly Fine Engraved, Crockett Curvilinear Incised, and Pennington Punctate Incised, which all date to around A.D. 1100-1350 (Bohannon 1973; Brown 1996; Bruseth 1998; Early 1993, 2002; Hoffman 1969; Perttula 2008; Schambach 1982). These types occur across the Caddo archaeological area, from Gahagan along the lower Red River up to Spiro and other Arkansas valley sites. Canton Incised, Maxey Noded Redware, and Sanders Engraved date to approximately the same time, A.D. 1100-1300, but occur most frequently along the middle Red River during the Sanders or Mound Prairie phase (Bruseth 1998; Perttula 2008).

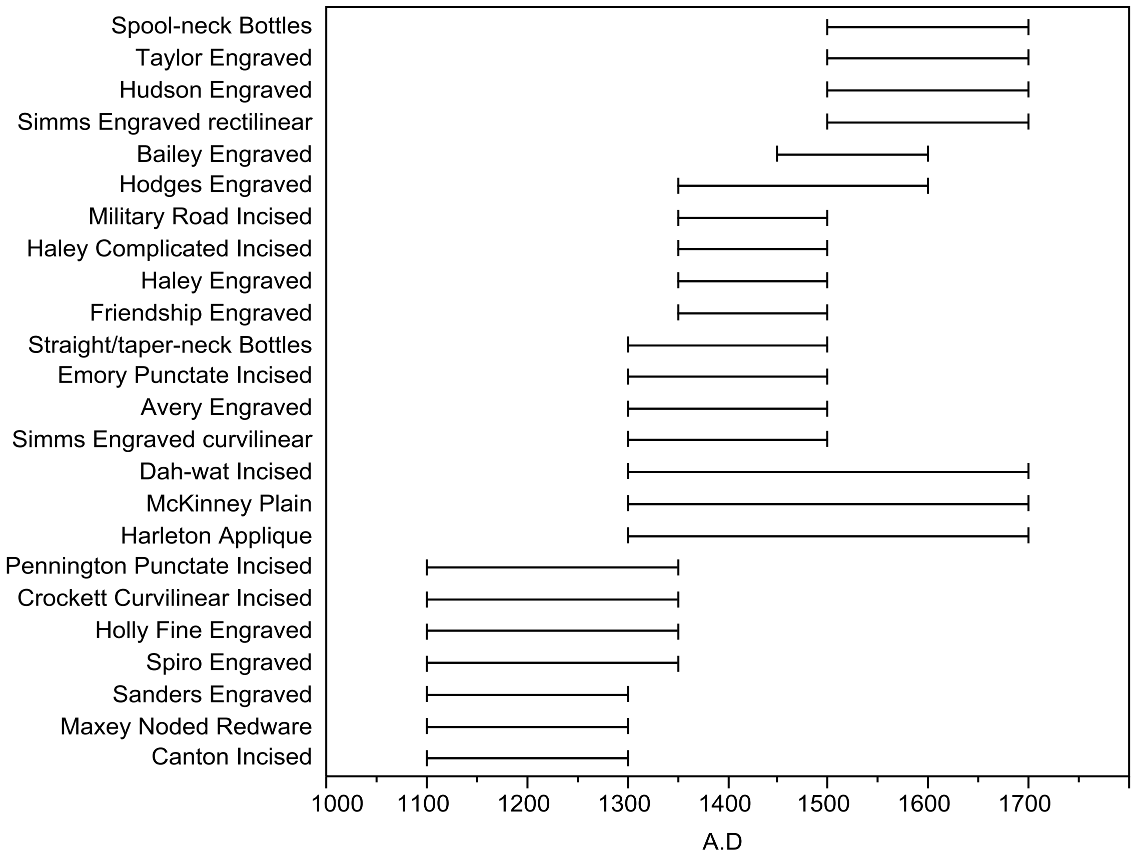


Figure 6.2. Approximate temporal span of chronologically-sensitive types and vessel forms found along the Mountain Fork. The beginning date for several McCurtain phase types, including Avery Engraved, McKinney Plain, Harleton Appliqué, and Dah-wat Incised, is uncertain.

Types dating from around A.D. 1350/1400-1500 include Haley Engraved, Friendship Engraved, Haley Complicated Incised, Military Road Incised, and Dunkin Incised (which has similarities to Dah-wat Incised) (Early 1981, 2002b; Hoffman 1969). These forms tend to occur most frequently in southwestern Arkansas, although Haley Engraved also occurs along the Little and Red rivers. Hodges Engraved may appear by around A.D. 1350 at the Mineral Springs site (Bohannon 1973), but it is more common after A.D. 1500 in the Great Bend region of the Red River (Hoffman 1969).

Avery Engraved, along with Nash Neck Banded, McKinney Plain, Emory Punctate Incised, Harleton Appliqué (as defined herein), and Dah-wat Incised are all part of the McCurtain phase of the upper Little River and middle Red River valleys that currently dates from around A.D. 1300-1700 (Bruseth 1998; Perttula 1992, 2008). The varieties of Avery Engraved present along the Mountain Fork probably occur in the earlier part of this phase, before A.D. 1500 (Perttula 1992:Table 11; Skinner et al. 1969). As discussed earlier, Dah-wat Incised probably persists later in the McCurtain phase than Emory Punctate Incised, because of the greater quantity of shell temper present for Dah-wat Incised. This interpretation is supported by the co-occurrence of Dah-wat Incised vessels variously with the rectilinear variety of Simms Engraved, Hudson Engraved, Avery Engraved, and Hodges *var. Taylor* Engraved vessels in four burials at Beaver and E. Johnson (Table 6.3). The association of Bailey Engraved vessels with Avery Engraved vessels in two burials (E. Johnson B11 and B13) suggests that this type may have dated before or around A.D. 1500 here.

Table 6.3. Associations between decorative types and varieties within burial contexts.

Site	Spiro Engraved	Holly Fine Engraved	Impressed full-field jar	Flat-body complex carinated bowl	Pinched carinated bowl	Bailey Engraved	Avery Engraved chevron	Simms curvilinear	McKinney Plain	Dah-wat Incised chevron	Hudson Engraved	Avery Engraved curvi-linear	Dah-wat Incised quadric-partite	Simms Engraved rectilinear	Hodges Engraved var. Taylor
Johnson B4														**1**	
Beaver B5													**1**	**1**	
Johnson B9													**1**	**1**	**1**
Beaver B17									**1**	**1**	**1**			**1**	
Johnson B12													**1**		
Johnson B13						**1**						**1**	**1**		
Beaver B6								**1**	**1**		**1**				
Beaver B12								**1**							
Beaver B15							**1**		**2**						
Johnson B11						**1**	**1**								
Johnson B2									**2**						
Johnson B8					**1**										
Beaver B8				**1**											
Johnson B1				**1**											
Beaver B2	**1**														
Beaver B4	**2**	**1**	**1**												

Based on work at the Kaufman/Roitsch site and other sites along the Red River, several McCurtain phase types including the scroll variety of Avery Engraved (not present along the Mountain Fork), Hudson Engraved, Simms Engraved, and Keno Trailed most likely date to after A.D. 1500 (Perttula 2008; Skinner et al. 1969). The curvilinear variety of Simms Engraved occurs earlier along the Red River than the rectilinear variety Simms Engraved. Taylor Engraved is most common to Titus phase sites in northeastern Texas, dating to post-A.D. 1500 (Perttula 1992:102-103).

Also helpful for this analysis, certain bottle forms in the Caddo area are chronologically sensitive. Bottles with pedestaled bases appear early, around A.D. 1100-1250 (Brown 1996). None of these have been found along the Mountain Fork. Then, from around A.D. 1300-1500, bottles tend to have straight or tapering necks and pear or extended cylindrically-shaped bodies (Hoffman 1969). After A.D. 1500 bottles with spool necks appear along the Red River (Hoffman 1969; Skinner et al. 1969).

In sum, both radiocarbon dates and chronologically-sensitive pottery types and forms are used here to examine the range of occupation at the Mountain Fork sites. Each radiocarbon date was calibrated using the OxCal 4.1 program with the IntCal 09 calibration curve (Bronk and Ramsey 2010; c14.arch.ox.ac.uk). Some sets of dates were also pooled, using the BCal Bayesian radiocarbon calibration program (Buck et al. 1999; http://bcal.sheffield.ac.uk). Dates were chosen for pooled means in situations when each assay probably dates a single archaeological event. At Ramos Creek, for example, 12 dates from the Block 1 structure were pooled, yielding a calibrated 2 sigma (encompassing 95% probability) range of A.D. 1319-1350 and 1385-1424. This issue of split ranges occurs many times in this analysis because of the fluctuation in the radiocarbon calibration curve during this period. The three dates from Hughes were also pooled, because all came from the same context, yielding a calibrated 2 sigma range of A.D. 1323-1347 and 1392-1436. The dates from Woods Mound A and those from Woods Mound F were each pooled, with a calibrated 2 sigma range of A.D. 1398-1443 for Mound A and A.D. 1308-1362 and 1385-1424 for Mound F. Although it was tempting to pool the Biggham Creek dates since they were all taken from the same single-stage mound, it appeared inadvisable because one of the dates had a calibrated age that was nearly two centuries earlier than the other two dates.

Approaching the radiocarbon dates on a site by site basis, the earliest dates come from the Beaver site, which evidently had a Middle Woodland component between A.D. 400 to 600 (Figure). These two dates came from charcoal samples in and near a refuse pit in Grid A. Other Woodland components along the Mountain Fork have been identified by Perttula and Nelson (2004) and Wyckoff (1967a:93-97).

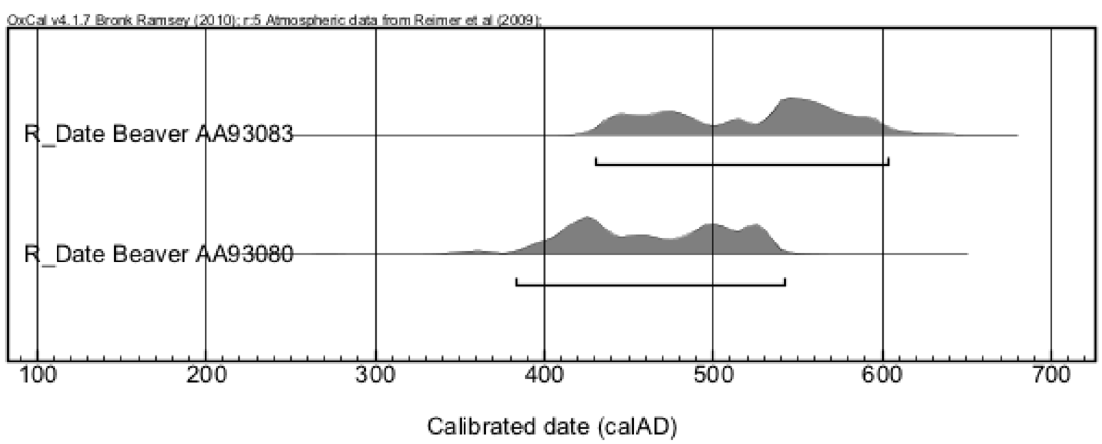


Figure 6.3. Probability curves for Middle Woodland dates from Beaver (cal. 2-sigma; Bronk Ramsey 2009, calibrated with OxCal 4.1 using IntCal 09 calibration curve).

The next earliest radiocarbon dates include two from E. Johnson, indicating a potentially lengthy occupation (or series of occupations) at this site dating from around A.D. 1000 to 1450. The two dates are from the same grid location, one from a depth of 16" and the other from 25". Reassuringly, the deeper sample yielded an earlier date. The earlier date has a two sigma calibrated range of A.D. 1035-1209 and the later a range of A.D. 1222-1447. Diagnostic pottery from this site confirms occupation from the early through the late Caddo periods, although it is uncertain whether or not the occupation was continuous. Bottle necks are all straight, confirming some occupation during the middle Caddo period, between A.D. 1300-1500. Overall, E. Johnson probably experienced an extended occupation or series of occupations between around A.D. 1000-1650.

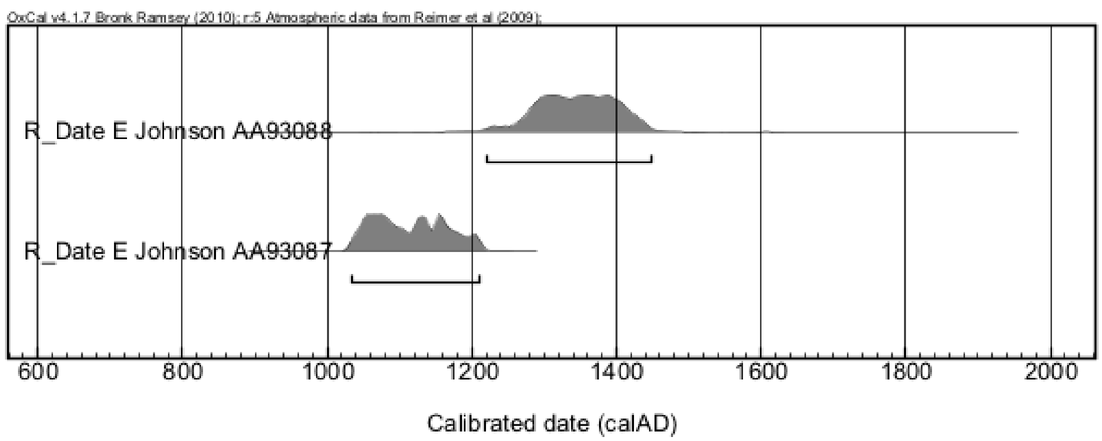


Figure 6.4. Probability curves for E. Johnson dates (cal. 2-sigma; Bronk Ramsey 2009, calibrated with OxCal 4.1 using IntCal 09 calibration curve).

Pottery from the Beaver site also suggests an extended occupation during the Caddo period, although the available late prehistoric dates from Beaver are more tightly clustered than those from E. Johnson (Figure 6.5). Interpreting the Beaver dates is somewhat complicated by the uncertain provenience of one of the dated samples, although that date falls well within the ranges of the others. The earliest Caddo period date is from Structure 3 and has a two sigma calibrated range of A.D. 1263-1495 (94.6 percent probability) and 1602-1616 (0.8 percent). The date with the uncertain provenience (either Structure 3 or Feature 3) ranges from A.D. 1316-1355 (23.0 percent) and 1388-1444 (72.4 percent). A sample from Grid A yields a range of A.D. 1419-1515 (89.6 percent) and 1600-1618 (5.8 percent) for the other. The last date is from Feature 3 and ranges from A.D. 1326-1344 (1.6 percent) and 1394-1649 (93.8 percent). Based on the probability curves, it is likely that the last three dates point to an early-mid 1400s occupation at Beaver, with the probability of occupation during the proceeding century indicated by the Structure 3 date.

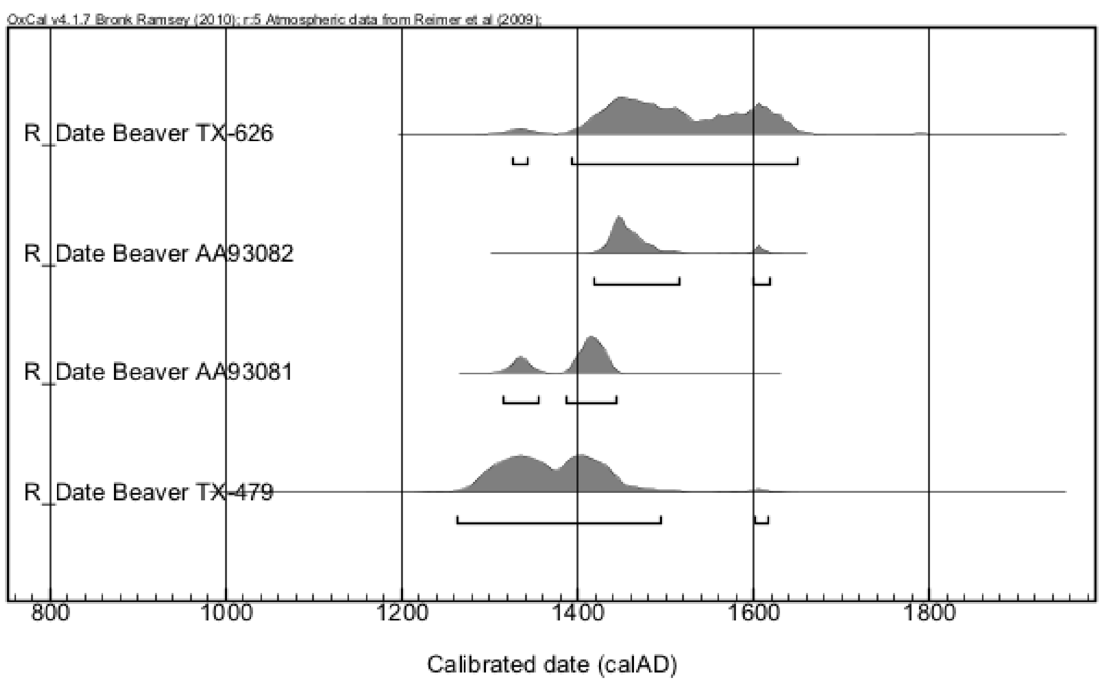


Figure 6.5. Probability curves for Caddo-period Beaver dates (cal. 2-sigma; Bronk Ramsey 2009, calibrated with OxCal 4.1 using IntCal 09 calibration curve).

As at E. Johnson, the diagnostic pottery at Beaver suggests a longer occupation than shown by radiocarbon dates alone, again from the early through the late Caddo periods. Most bottle necks at Beaver are straight or tapering, evidence for the middle Caddo occupation, but one vessel from Burial 17 (Hudson) and one other rim sherd have spool necks, pointing to post-A.D. 1500 use of the site. A rectilinear Simms Engraved vessel is also part of the Burial 17 grave lot, confirming a later date for that interment. Overall, Beaver may have experienced occupation (or occupations) between around A.D. 1000-1650.

Mound A at Biggham Creek was likely constructed while Beaver and E. Johnson were still being occupied. Two dates from Mound A have probability curves that suggest construction of this single stage mound between the mid-1400s and the mid-1500s (Figure 6.6; calibrated two sigma ranges of A.D. 1444-1528 [57.4 percent] and 1552-1634 [38.0 percent] for the first sample and A.D. 1468-1641 for the second). A third date from Biggham Mound A, however, ranges from A.D. 1156-1273. Because one of the later dates actually comes from a lower context than the early date and because of the quantity of late diagnostic pottery that came from Mound A, the early date will be tentatively disregarded.

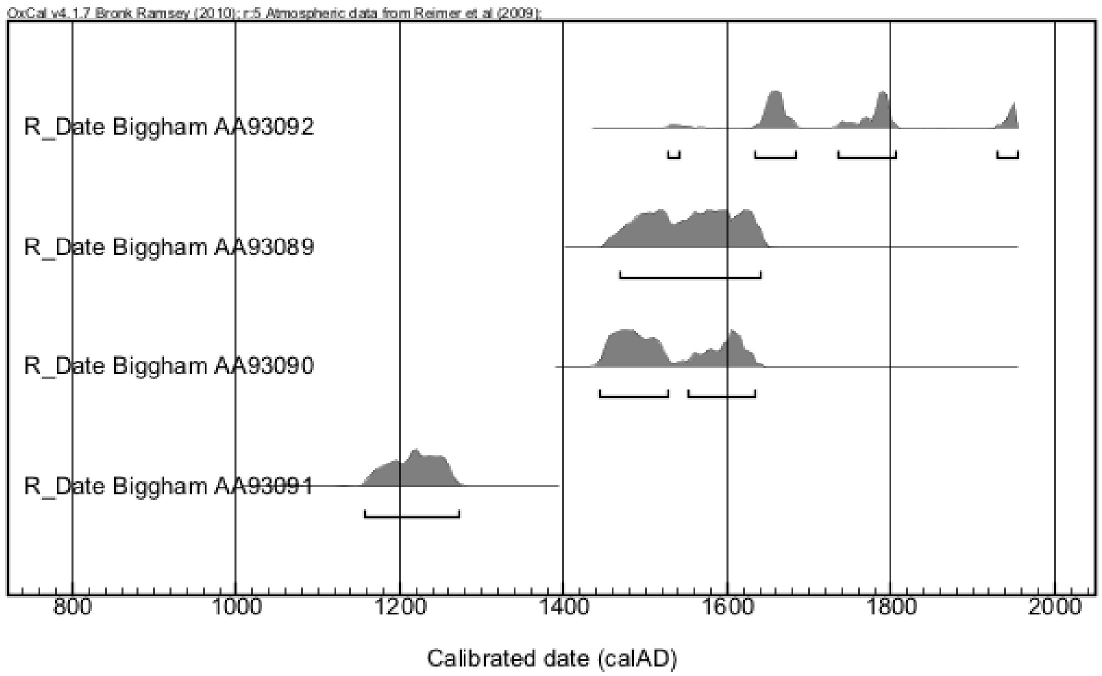


Figure 6.6. Probability curves for Biggham Creek dates (cal. 2-sigma; Bronk Ramsey 2009, calibrated with OxCal 4.1 using IntCal 09 calibration curve).

Although two Spiro Engraved sherds were present at Biggham Creek, the majority of the diagnostic pottery dates to middle to late Caddo periods. A large proportion of Simms Engraved, Hudson Engraved, and Hodges Engraved sherds and vessels suggest that the site received heaviest use post-A.D. 1500. The only bottle present at Biggham Creek has a spool neck and is Hudson Engraved, further supporting this late date.

The radiocarbon dates from Hughes, Woods, and Ramos Creek suggest shorter periods of occupation than at either E. Johnson or Beaver (Table 6.4). The pottery confirms relatively short occupations in the case of Woods and Ramos Creek, but indicates that Hughes may have had a longer occupation or repeated occupations, which was originally suggested by Wyckoff (1966).

Table 6.4. Pooled date ranges.

Site	n dates	Early range (cal. 2 sigma)	Late range (cal. 2 sigma)
Ramos Creek Block 1 structure	12	A.D. 1319-1350 (53.3%)	A.D. 1385-1424 (43.3%)
Woods Mound A	3	--	A.D. 1398-1443
Woods Mound F	3	A.D. 1308-1362 (52.4%)	A.D. 1385-1424 (42.2%)
Hughes	3	A.D. 1323-1347 (18.3%)	A.D. 1392-1446 (76.3%)

The three pooled dates from Hughes, all from Feature 2, a fire pit, yield calibrated 2-sigma ranges of A.D. 1323-1347 and 1392-1436 (Figure 6.7). The individual calibrated dates range from A.D. 1292-1448. The most recently acquired date (AA93084) has a 2 sigma calibrated range of 1320-1351 (15.5 percent probability) and 1391-1445 (79.9 percent probability).

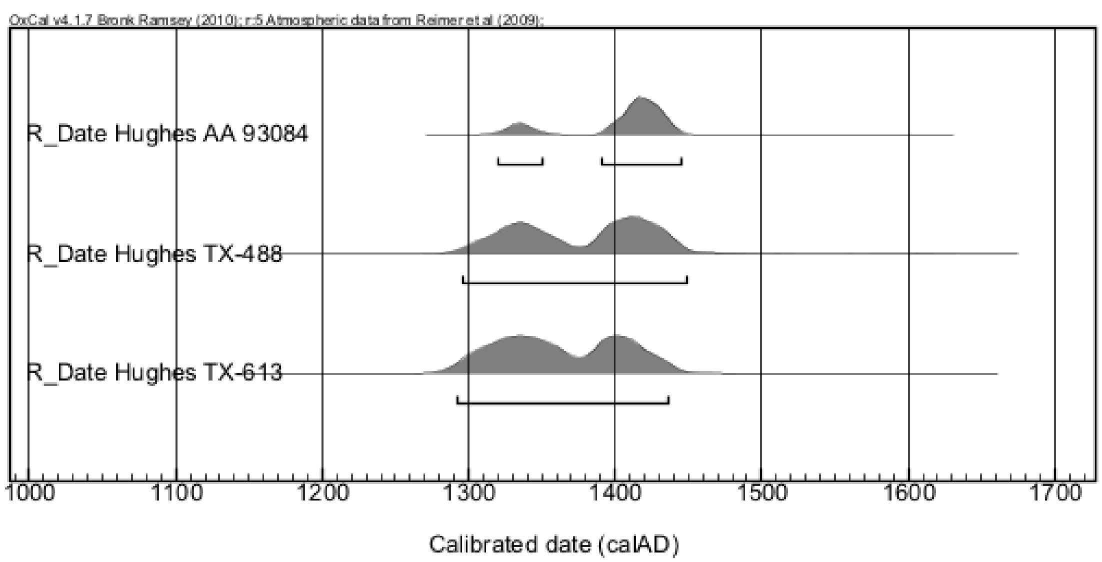


Figure 6.7. Probability curves for Hughes dates (cal. 2-sigma; Bronk Ramsey 2009, calibrated with OxCal 4.1 using IntCal 09 calibration curve).

The three Hudson Engraved sherds from Hughes were all from the surface or from the limited excavation at Trench 4, which was about 250 feet southwest of Feature 2 where the charcoal samples were taken. The pottery from Trench 1, in which Feature 2 was located, included sherds of both Canton Incised (n=4) and Crockett Curvilinear Incised (n=5). This supports an earlier fourteenth-century date for the occupation uncovered in Trench 1. Two distinct Military Road Incised sherds were also found on the surface, which together with the Hudson sherds suggests that Hughes was either reoccupied at a later date or that the duration of the occupation extended at least into the fifteenth century.

At Ramos Creek, the most recently excavated site in this analysis, many charcoal samples were acquired from the burned structure in Block 1 and one from Block 2 (Figure 6.8). When pooled, dates from twelve of the Block 1 samples yielded calibrated 2 sigma ranges of A.D. 1319-1350 and 1385-1424. A single sample was acquired from the pit feature in Block 2 and it yielded calibrated 2 sigma ranges of 1421-1521 (86.0 percent probability) and 1592-1620 (9.4 percent probability). Not much diagnostic pottery was found at Ramos Creek, but one sherd of Sanders Engraved from a carinated bowl supports occupation of the structure during the earlier part of the 1300s. One possible sherd of an early form of Simms Engraved was also found in the structure, but the decoration on this sherd was inconclusive and it may have been improperly classified. Pottery was found across the terrace, so it is entirely possible that occupation of the site as a whole did extend into the 1400s as suggested by the Block 2 date.

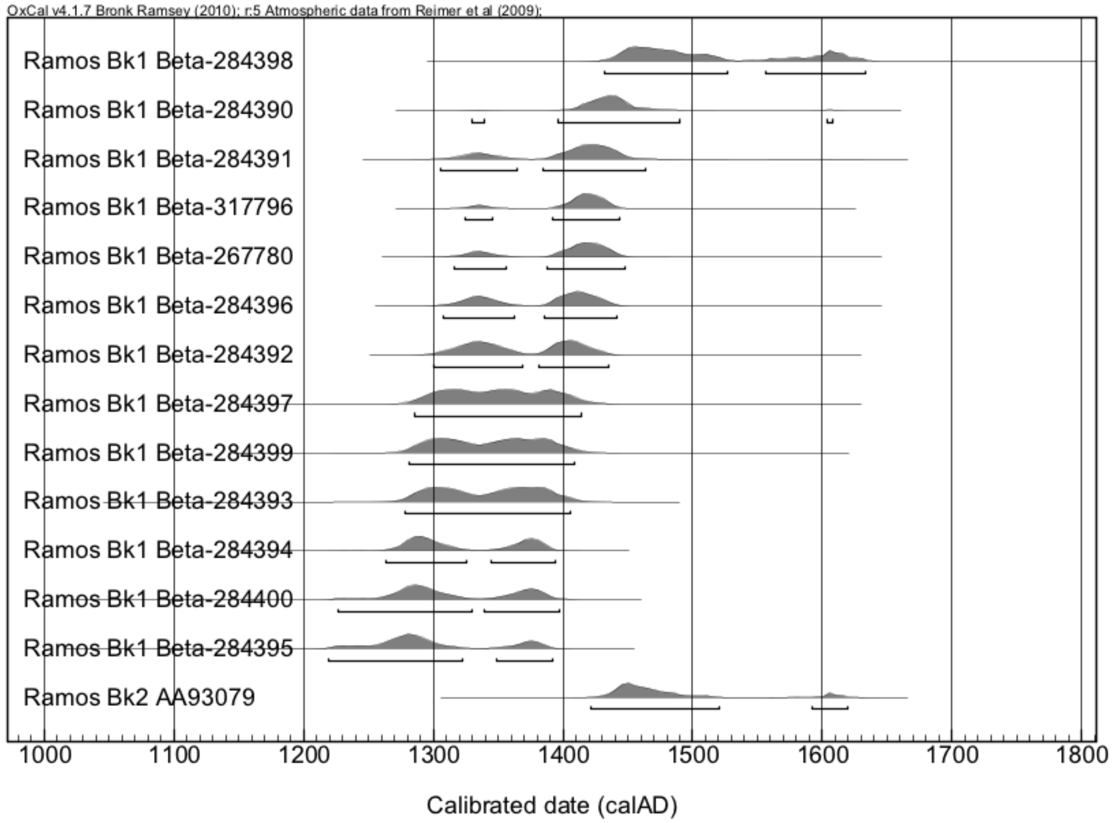


Figure 6.8. Probability curves for Ramos Creek dates, including 13 dates from the Block 1 structure (top) and one date from Block 2 (bottom) (cal. 2-sigma; Bronk Ramsey 2009, calibrated with OxCal 4.1 using IntCal 09 calibration curve).

We have seven dates from Woods Mound Group: three from Mound A, three from Mound F, and one from Mound BB (Figure 6.9). As previously stated, the date from Mound BB has an unacceptably long range and so will be disregarded. When pooled, the Mound A dates have a calibrated 2 sigma range of A.D. 1398-1443. Unpooled, they range from A.D. 1278-1623. The pooled dates from Mound F have calibrated 2 sigma ranges of A.D. 1308-1362 and 1385-1424. They may be skewed towards an earlier range than Mound A by one date with a particularly large error margin of ± 80 years (GaK-901). However, the most recently acquired date from Mound F with the smallest margin of error (± 43 years) is AA86287 and it still has calibrated 2-sigma ranges of A.D. 1299-1370 and 1380-1431, correlating closely with the pooled ranges. Based on the similarities of pottery between the four excavated mounds, it is likely that they all dated to the late 1300s to early 1400s. This later date is also supported by two Haley Engraved sherds from a posthole and pit feature under Mound A, a Military Road Incised sherd from Mound A, and a Friendship Engraved sherd from Mound F. The Friendship Engraved sherd was found in the upper level of the mound fill, though, so it is possible that the structure under Mound F was built earlier than the structure under Mound A. Two Canton Incised sherds at the site, including one extraordinarily similar to a sherd from Hughes, also support an early 1300s date for initial occupation at Woods, probably extending into the early 1400s. The elbow pipe from Mound F attests to a post-1400 occupation on this part of the site.

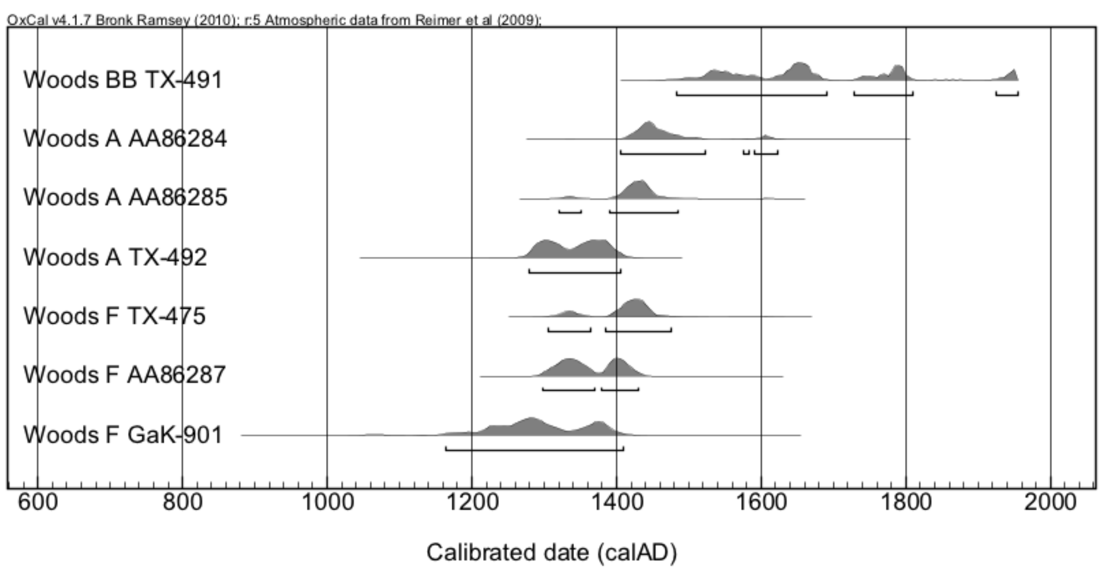


Figure 6.9. Probability curves for Woods, marked by mound (A, BB, or F) (cal. 2-sigma; Bronk Ramsey 2009, calibrated with OxCal 4.1 using IntCal 09 calibration curve).

In conclusion, both radiocarbon dates and the presence and relative quantity of chronologically-sensitive pottery types help to approximate ranges of Caddo-period occupation for these six Mountain Fork sites (Table 6.5). E. Johnson and Beaver were both occupied for the longest durations, either continually or intermittently between around A.D. 1000/1100 to post-A.D. 1500. Ramos Creek, Woods, and Hughes were all occupied for a shorter duration between A.D. 1300 to 1500. Biggham Creek was in use later, between A.D. 1400 to post-A.D. 1500. It is likely that E. Johnson and Beaver were contemporaneous to all of the other sites. Ramos Creek, Woods, and Hughes, though, although probably contemporaneous to each other, may not have been contemporaneous to Biggham Creek.

Table 6.5. Approximate ranges of occupation(s), based on both radiocarbon dates and chronologically-sensitive pottery types.

<table>
<tr><th>Dates A.D.</th><th>Ramos Creek</th><th>Woods</th><th>Hughes</th><th>E. Johnson</th><th>Beaver</th><th>Biggham Creek</th></tr>
<tr><td>1600</td><td></td><td></td><td></td><td rowspan="7"></td><td rowspan="7"></td><td rowspan="3"></td></tr>
<tr><td>1500</td><td></td><td></td><td></td></tr>
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<tr><td>1100</td><td></td><td></td><td></td><td></td></tr>
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These chronological differences must be kept in mind when attempting to identify social relationships between contemporaneous communities using pottery style as a proxy. Pottery styles from Ramos Creek, Woods, and Hughes may perhaps be legitimately compared. The abundance of contextually-mixed pottery from different time periods at E. Johnson and Beaver makes it difficult to attempt to identify degrees of social relatedness between those sites and any others, though.

Although degrees of social relatedness cannot be easily inferred, at least the pottery from sites with limited periods of occupation (Ramos Creek, Woods, Hughes, and Biggham Creek) and the pottery from discrete contexts (mainly vessels interred with the deceased) at Beaver and E. Johnson do assist in the development of a pottery chronology for the Mountain Fork. Based on radiocarbon dates and the known chronologically-sensitive pottery types other chronological markers may perhaps be inferred. This will help with any future excavations and studies in this valley and adjoining regions.

Establishing the Mountain Fork chronology may be most significant for identifying significant changes in ceremonial practices, implicating changes in political dynamics, from the middle (A.D. 1300-1500) to late Caddo (post A.D. 1500) periods. Although similar forms of buried structure mounds were constructed at both Woods and Biggham Creek, other evidence shows that distinctly different activities were taking place at each of these places. This shift, which will be explored in depth later, may be unique to the Mountain Fork society, but it may also intersect with broader trends and occurrences in the wider Caddo area.

Mountain Fork Social Identity

Establishing the chronological relationships among the Mountain Fork sites was a necessary precondition for exploring both the social relationships between contemporary communities and the dynamics of change in the valley over time. This involves examining issues of social identity, using pottery styles as a proxy for relationships both between Mountain Fork communities and with extra-local communities and regions. As discussed earlier, my original goal was to use both individual attributes and decorative types to analyze different scales of social identity.

Attributes related to vessel fashioning, especially rim and lip attributes, were compared across sites to address whether potters in relatively contemporary communities interacted regularly enough to create a learning community with shared formation practices. These attributes were analyzed separately within each form of pottery to avoid comparing practices that may have varied across vessel forms. If communities interacted regularly, then it is likely that few differences in these attributes would exist between sites. If communities were socially isolated from each other, then more attribute differences would exist.

The diverse assemblage of pottery forms, relatively small number of rim sherds for certain vessel forms, and questionable contemporaneity between sites made this form of analysis somewhat problematic. Any attribute differences between rim sherds at Ramos Creek and Beaver, for example, even within a single vessel form, could be a result of chronological distance rather than social distance. This problem could be alleviated if I only compared formation attributes within specific decorative types, but so many types exist within Caddo pottery that the sample sizes for each type became far too small. The difficulty was aggravated by the fact that two of the sites with the narrowest contemporary chronological windows (Ramos Creek and Hughes) had the smallest sample sizes.

Jars were the only vessel form for which an acceptably large sample size of rim sherds (or whole vessels) existed at all of the sites. No significant differences between rim and lip attributes could be identified between sites except in the case of rim treatment.

Three rim treatments occur on jars in the Mountain Fork assemblages: plain (rounded) rims, castellated rims with four peaks, and scalloped rims. The majority of the rims in the assemblages were plain, but Woods and Beaver each had five castellated jar rims. This could hint at a social connection between these communities. However, one of the castellated jars occurs with Burial 6 at Beaver in conjunction with a Hudson Engraved vessel. This vessels likely dates to the late fifteenth century, whereas the Woods vessels probably date the fourteenth or early fifteenth century. So, it is not at all clear that the practice of castellation indicates contemporary interacting communities.

In some places archaeologists have used decorative elements as proxies for identifying social connections and boundaries between pottery-making communities (Parkinson 2006; Regnier 2006). In the Caddo area, though, variation in the use of decorative elements tends to be subsumed into decorative types and their various decorative configurations. So, I next looked at these to address social identity.

Elements that cross-cut types are those most likely to be symbolically important and geographically widespread. For example, the scroll element found on some Simms Engraved, Hodges Engraved, and Hudson Engraved vessels is so common across the Caddo area that it almost certainly signified more than simply shared learning environments. Such symbolic, widespread elements are not particularly helpful for looking at small-scale differences in social identity, unless their proportions vary dramatically between nearby sites. That type of difference may indicate a functional difference between sites, though, rather than a difference in basic social identity between small communities of households. Small variations within those elements, however, in terms of technique or embellishment, might indicate differences in social identity (when looking at contemporaneous vessels). Accordingly, a lack of variation within these common elements could indicate social integration.

Utility wares that presumably transmit less symbolic content[5] may be the most useful means for looking at social identity and potentially political divisions among Mountain Fork communities. The distribution of decorative variation among particular forms of vessels (for example, jars) is likely to be the most informative. Similarities in decorative variations should indicate that community members interacted regularly in some fashion and were allied or otherwise connected socially and politically. Differences, however, are more difficult to interpret, especially when the contemporaneity of sites or vessels is uncertain. In some cases differential distribution of decorative types or varieties among sites may indicate different periods of occupation. This is informative for studying the history of occupation along the Mountain Fork, if not social identity directly, and is basically what we looked at in the chronology section. When looking at the sites with more restricted periods of occupation, though, namely Ramos Creek, Woods, and Hughes, differences in decorative types or varieties, especially those that were locally abundant, may indicate differences in social identity.

Decorative types and varieties are also useful for tracing connections between communities with other regions through time. This is more clear-cut, especially when small quantities of decorative types are present that are most commonly found in other regions. The presence of these types indicates some sort of social connections with extra-local communities, either through migration, exchange, the maintenance of extended social networks, or the active signification of political affiliation. Similarities in

[5] Although see Dowd 2011a for my analysis of amphibian depictions on Caddo jars. More symbolic or iconographic content may exist on Caddo utility wares than usually recognized.

the direction of extra-local affiliation between Mountain Fork sites may indicate that they share a similar social identity. Using the direction of extra-local affiliation as a proxy for social identity could be useful when looking at the sites with small sample sizes.

Local Utility Wares and Local Techniques

When looking at contemporary local utility wares, Canton Incised sherds (ca. A.D. 1100-1300) occur everywhere except for Ramos Creek and Biggham Creek. It is not surprising that they are absent from Biggham Creek, but slightly more surprising that none were found at Ramos Creek, especially since a Sanders Engraved sherd from the same period was found there. This probably has to do with the small sample size at Ramos Creek. Some of the Canton Incised sherds from Woods and Hughes look very similar, suggesting a connection between these sites (Figure 6.10). Woods and Hughes are also the only two sites with Military Road Incised sherds.

Figure 6.10. Canton Incised sherds. Sherd on the right is from Hughes; sherd on the left is from Woods.

Among local jars, Emory Punctate Incised occurs everywhere, but in relatively low numbers at Biggham Creek compared to the other jar types. This is likely because the type did not persist as long as Dah-wat Incised and Harleton Appliqué. Harleton sherds occur at E. Johnson, Beaver, and Biggham Creek, in keeping with a later date for this type. Dah-wat Incised occurs at every site, but only a single identifiable sherd is present in the Woods assemblage (compared to 10 Emory Punctate Incised and six McKinney Plain sherds). Even Ramos Creek and Hughes have seven and two Dah-wat Incised sherds, respectively. I find the low number of recognizable Dah-wat at Woods interesting, especially because of the general preponderance of jars and utility wares at Woods. Aside from this difference, however, the composition of decorative types among all six of the utilitarian assemblages suggests more social integration than difference. The preponderance of the trailed-incised technique (rather than engraving) among the Hudson “Engraved” sherds at the sites with later components also suggests social integration of these communities.

Extra-local Affiliation

A number of types that are most common to the Ouachita Mountain of southwestern Arkansas occur in the Mountain Fork assemblages. Military Road Incised occurs at both Hughes and Woods. Sherds from probably a single Haley Complicated Incised jar are present at E. Johnson. Woods and Beaver each have sherds from a Friendship Engraved vessel, but the Beaver sherd only tenuously belongs in this category. Sherds from Haley Engraved bottles are present in small numbers at Woods, Beaver, and Biggham Creek. Sherds from Hodges Engraved bottles are present at E. Johnson, Beaver, and Biggham Creek. Hodges occurs at the same time as Military Road and the Haley types at the Mineral Springs site, but later at Belcher phase sites along the Red River.

These types point to connections between the Mountain Fork and valleys in southwestern Arkansas, starting at Woods, Hughes, E. Johnson, and Beaver around A.D. 1350/1400. Woods seems to have a particularly clear connection, with sherds from Military Road Incised, Haley Engraved, and Friendship Engraved vessels. No clear indications of this connection exist at Ramos Creek, but the sample size there was comparatively very small.

The pottery indicates that somewhere around the late A.D. 1400s into the early 1500s the communities living at the southern sites, E. Johnson, Beaver, and Biggham Creek, started affiliating more strongly with the Red River and northeastern Texas. Types common to the Red River including Hudson Engraved, Avery Engraved, and Simms Engraved appeared at all three sites. By this point Ramos Creek, Woods, and probably Hughes were abandoned and the ceremonial attention of the Mountain Fork Caddo shifted from Woods to Biggham Creek.

In summary, the major differences in social identity between the Mountain Fork sites seem to be related to a shift in extra-local affiliation over time, rather than to local social or political divisions. After looking east towards the Ouachita Mountains of southwestern Arkansas during the A.D. 1300s and 1400s, the Mountain Fork Caddo started affiliating more closely with the later McCurtain phase communities of the Red River and Little River in Texas and Oklahoma. Concurrently, the northernmost sites along the Mountain Fork were abandoned and ceremonial focus shifted from Woods to the southern Biggham Creek. I will discuss concurrent settlement pattern trends in these neighboring regions in Chapter 7.

Even before this southern shift, however, the pottery assemblage at Woods was distinct from those at the other sites. Despite Woods' high proportion of utility wares and jars, evidence for Dah-wat Incised vessels was rare. This could indicate that Dah-wat Incised started later than I thought and that Woods was occupied for an even briefer period of time than indicated by the radiocarbon dates, perhaps during the early A.D. 1300s. Other unique properties of the Woods assemblage will be discussed in the next section, in which I compare the pottery assemblages between the two Mountain Fork mound sites, Woods and Biggham Creek.

Mound Site Pottery: Woods and Biggham Creek

Chronological differences alone cannot explain the striking discrepancies between the Woods and Biggham Creek pottery assemblages. Substantial differences exist in surface treatment, vessel forms, vessel sizes, and types of decorative styles present at the two sites. The pottery differences must be related to differences in activities at these mound sites. This challenges assumptions regarding buried structure mound sites in the Caddo area and opens up a new line of inquiry into the diversity of activities that occurred at these ritually-significant places.

First, Woods has a very low ratio of fine to utility wares compared to the other sites, 0.04 compared to a range of 0.12 to 0.16 for the four non-mound sites. A chi-square test was conducted to compare the actual quantities of fine wares versus utility wares across the sites to the expected quantities based on the average relative proportions of those wares. The results showed that the difference between the proportion of fine and utility vessels at Woods as compared to Biggham was very significant (χ^2=37.79957, df=1, p=7.84E-10 [RStats Institute 2011]). Phrased another way, the test said that there is less than a 0.000000000784 chance that the differences between Woods and Biggham with respect to the proportion of fine versus utility vessels can be attributed to random chance alone. Correspondingly, Woods has a particularly low proportion of red slipped wares, 0.24 percent compared to three to five percent at most of the other sites (except Hughes).

Second, the proportion of jars in the Woods assemblage was nearly twice as high (81 percent) as at almost any other site (Table 5.32). Biggham Creek had approximately the same proportion of jars (42 percent) as most of the other sites, though. Additionally, the jars at Woods tended to be larger than those at Biggham, although not by a statistically significant amount. The mean rim diameter of jars at Woods was 23.8 cm as compared to 20.1 cm at Biggham Creek. The larger mean diameter at Woods is related to the fact that the largest jar in the Mountain Fork assemblages was found there. Three jar rims at Woods were very large, greater than 30 cm in diameter, as opposed to one very large jar rim at Biggham Creek.

At Woods, a disproportionately small quantity of pottery was recovered from Mound B in comparison to the other three mounds (Figure 6.11). Since all four mounds were roughly the same size and relatively equal amounts of excavation took place on each, this discrepancy is notable. No other apparent differences exist, however, between the forms or decorative types of pottery from each mound.

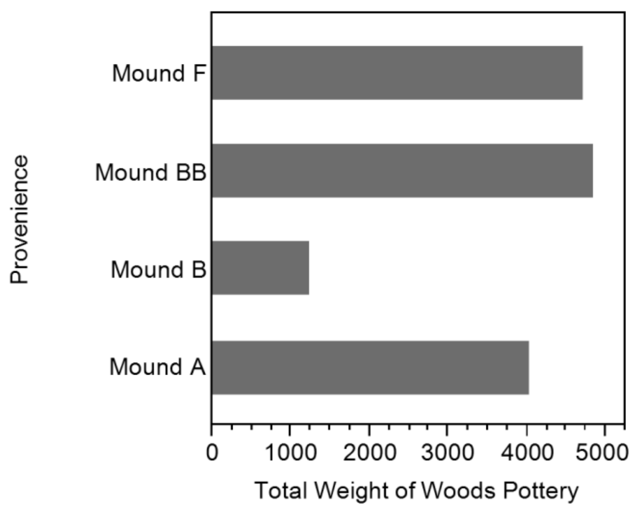

Figure 6.11. Weight (grams) of pottery from mound excavations at Woods.

Summary

Analysis of the extensive quantities of pottery recovered from sites along the Mountain Fork in conjunction with both older and recently acquired radiocarbon dates from these sites proved fruitful for addressing the major goals of this project. The analysis resulted in several significant findings. First, a shift in occupation occurred sometime around A.D. 1450 away from the northern sites in the valley. Concurrently the focus of ritual practices shifted from Woods to Biggham Creek.

Second, this shift in occupation and ritual focus was accompanied by changing extra-regional affiliation, from the Ouachita Mountain communities to the east in present day Arkansas to the McCurtain phase communities to the south and southwest along the Little and Red Rivers. Unfortunately it was difficult to discern differences in social relationships between contemporaneous sites within the Mountain Fork valley, but little evidence for a *lack* of social integration exists.

Third, significant differences exist between the Woods and Biggham Creek pottery assemblages. Whereas very few fine decorated wares were present at Woods, a significantly high proportion of the Biggham Creek assemblage consisted of fine decorated wares. Also, twice as many jars were present in the Woods assemblage compared to any other site and these jars tended to be large.

In the next chapter I interpret these findings in relation to the social history of the Mountain Fork Caddo, focusing particularly on the leadership styles and sociopolitical dynamics represented by the activities at Woods and Biggham Creek.

Chapter 7: Mounds along the Mountain Fork

The overarching goal for this project was to develop a detailed model of sociopolitical dynamics among the Mountain Fork using archaeological evidence to examine the history of the ancestral Caddo living along this river from around A.D. 1000-1600. Three major research objectives were accomplished. First, I expanded and examined the chronology of site occupation within the valley to develop a basic picture of the history of land use. Second, I investigated social integration among Mountain Fork communities and their relationships with neighboring regions, in order to trace social and political affiliations through time. The third objective, the topic of this chapter, is to examine the intersection of political leadership and ritual practice as expressed at the two mound sites in the valley, Woods and Biggham Creek. Investigating the activities that occurred at these ritually-charged places and looking for evidence of inclusivity versus exclusivity and status differentiation helps us to interpret how leadership was expressed at these places. Furthermore, because Woods and Biggham Creek were occupied at different times, any differences between these sites indicate changing forms of leadership and socio-political organization within the Mountain Fork society.

This chapter begins with a short review of the social history of the Mountain Fork Caddo, summarizing evidence of site chronology and social affiliations within the valley and with neighboring regions presented in the previous chapter. Next, I discuss the most visible evidence for ritual activity along the Mountain Fork, buried structure mounds, together with another feature that may have been overlooked at Woods, upright poles in mounds. The time depth of these features in Caddo history indicates that both of these activities were highly significant. Evidence suggests that mound construction invoked themes related to death, life, and renewal, as well marking socially- and spiritually-important places on the landscape, and poles assisted in spiritual communication. Sites with ritual activity are excellent places to investigate leadership forms because leaders would have accrued social status from arranging ritual activities that benefited the community. This is particularly true among the Mountain Fork Caddo, because little evidence exists that they acquired power through the control of surplus maize production or by any sort of direct control over the population. Instead, leaders here evidently acquired status or power through organizing ritual activities and negotiating spiritual relations for the community.

After establishing the ritual significance of these places, I develop models for interpreting the material correlates for different forms of leadership at these places, drawing on other studies of leadership and ritual in the Southeast and on Caddo ethnohistory. Then the evidence from Woods and Biggham Creek is compared to these expectations. Distinct contrasts between the two sites emerge regarding the relative degree of inclusivity versus exclusivity, implying that social practices in ritual contexts shifted over time, correlating with a change in the nature of religious-political leadership.

I conclude the chapter by comparing this shift in leadership forms to developments in other parts of the Caddo area. In particular, I consider how this change intersected with the intensification of maize production across the Caddo area and concurrent population migrations. Specialization of religious leadership among the Mountain Fork Caddo may have been directly related to a broader change in political economy that eventually lead the Mountain Fork communities south, out of the mountain valley and down towards the broader floodplains of the Little and Red Rivers.

History of the Mountain Fork Caddo

The earliest recognizably Caddo occupations along the Mountain Fork were at Beaver and E. Johnson, which were both occupied starting in the early Caddo period sometime before A.D. 1300. Then settlements began to appear in the more northerly part of the drainage at Ramos Creek, Woods, and Hughes, sometimes during the A.D. 1300s to early 1400s. Ramos Creek is the farthest to the north, separated from Woods by about 12 kilometers. Sites exist between Ramos Creek and Woods, but the valley is very narrow along this stretch of the Mountain Fork with sparse arable terraces and most of those sites were probably temporary camps. No surveys have been conducted north of Ramos Creek, but the valley widens out again at from this point northward with more good land for farming. It is possible that more sites may exist along this northern stretch of the river.

The pottery present at many of the Mountain Fork sites, particularly at Woods and Hughes, suggests that these communities had strong ties to the Caddo societies living to the east in present-day Arkansas. Woods had very few fine decorated wares, but sherds of Friendship Engraved and Haley Engraved vessels were present. Woods and Hughes also each had sherds from Military Road Incised jars. No sherds at Ramos Creek were associated with types better-known from Arkansas, but the sample of decorated sherds from Ramos was quite small.

By the mid-A.D. 1400s Ramos and Woods appear to have been abandoned. Occupation at Hughes seems to have extended for a longer period of time, or the site was reoccupied, based on the presence of some Hudson Engraved sherds.

Occupation at Biggham Creek also began around sometime between the mid A.D. 1400s and early A.D. 1500s.

During this period, the pottery at E. Johnson, Beaver, and Biggham Creek began to reflect more connections to styles common along the Red River and Little River to the south and southwest. This was particularly noticeable at Biggham Creek post-A.D. 1500. Avery Engraved, Simms Engraved, and a local trailed-incised version of Hudson Engraved became the prevalent fine wares.

This evidence suggests that a shift in extra-local affiliation occurred somewhere between A.D. 1400 and 1500, towards the end of the middle Caddo period, from the Ouachita Mountain societies to the east to the Little River and Red River societies to the south-southwest. This shift was accompanied by the apparent abandonment of the northern part of the drainage. Then, by around A.D. 1600 at the latest, all of the Caddo communities had left this part of the Mountain Fork. This development was paralleled in other Ouachita Mountain societies to the east (Early 1982; Perttula 2012). It is likely that at this point the Mountain Fork Caddo moved south towards the Red River, joining communities that would eventually coalesce as the historic Kadohadacho confederacy.

Ritual Activity along the Mountain Fork

The most durable and easily-visible evidence of ritual activity along the Mountain Fork are the buried structure mounds present at Woods and Biggham Creek. As discussed in Chapter 2, this type of mound construction has a long history in the Caddo area, extending back to around A.D. 1000. These mounds were built along the Mountain Fork between approximately A.D. 1300 to 1500, first at Woods, and then at Biggham Creek.

Burying buildings with earth was deeply situated within the social memory of the Caddo. Although the exact meaning of this act may have been variably interpreted in different times and places, it was a shared cultural practice that was widespread both chronologically and geographically. Social memory refers to "a collective notion (not an individual belief) about the way things were in the past" (Van Dyke and Alcock 2003:2, referring to Connerton 1989; Halbwachs 1975[1925], 1992[1950]; Hutton 1993). A number of authors have focused on how people use social memory as a political resource, particularly in relation to the creation, maintenance, and recreation of social landscapes (such as mound sites) in order to legitimate a particular social order (Pauketat and Alt 2003; Wilson 2010). Others have discussed how place-making and memory intersect when people create more durable architectural forms in order to emphasize permanence and connection to a place (Connerton 1989; Halbwachs 1992[1950]; Joyce 2004; Tringham 2000).

Ritual is one way of maintaining social memory and is also a way to reproduce a sense of continuity of life itself (Rowlands 1993). The ritual act of creating mounds by burying buildings was a way of reproducing social memory, that is, a way of reproducing the shared meanings associated with that act. Mound creation associated those meanings with particular places on the landscape, both physically and socially creating a durable, memorable, and significant place.

Different meanings have been ascribed to mound building in the Southeast. Knight (1981, 1986, 1989) interprets mound construction as part of ceremonies emphasizing continuity, by enacting themes of ritual purification and world renewal. The burial of structures and creation of mounds in the Caddo area likely invoked similar cycles of life, death, and renewal. Building a structure gave it life and covering it with earth literally and figuratively buried it, ending its life cycle. Some structures were also burned before burial. Fire and burned structures were historically associated with death and renewal (Kay and Sabo 2006; Swanton 1996:184-192, 216-217). Burning a building also sends smoke into the air, and historically smoke has been particularly significant to the Caddo as a means of spiritual communication (Schambach 1996). Whatever meaning or use a structure had during its life, burying it upon death signified that someone wanted that place and their presence there to be remembered. By personifying certain structures through life-cycle rituals, the Mountain Fork Caddo built their identity into the landscape, creating places richly imbued with the reproduction of social memory.

Sometimes in the Caddo area additional structures were built on top of the first buried structure, creating multi-stage mounds and invoking renewal of the life cycle. In some parts of the Southeast new stages were added to mounds when a leader died and a new leader took office. Additional structures or stages were not added to the mounds at Woods or Biggham Creek. One explanation for this is that the sites were utilized for relatively short durations. Another may be that the structures and mounds were not associated with distinct positions of leadership.

Structures were not the only archaeologically-recognizable non-animate objects involved in life-cycle ceremonies and spiritual communication among the Caddo. Upright poles also played a prominent role in a number of ceremonies. Among the Nabedache in 1691, Casañas described the men undergoing a period of preparation before leaving to raid another tribe (Swanton 1996:190-191). As the men prayed, dance, and sang, they made a series of offerings, and a portion of each offering was attached to a pole. A man “who looks like a demon” sat near at hand; evidently he was a spiritual leader of some sort and oversaw the rituals (Swanton 1996:190-191). Other important objects included were tobacco, buffalo fat, and incense, which were burned in a fire, resulting in plumes of smoke. Casañas (Bolton 1987:156) also wrote of the funeral of a *xinesi* where people danced in front of a pole with symbolic representations of celestial bodies attached to it.

Going further back in time, upright cedar poles played a critical role in Craig Mound at Spiro. Brown (1996:94) suggests that the overlapping upright cedars that came out of Craig served as a connection between the cosmological tableau of the Great Mortuary and the heavens. The cedar poles created an axis mundi, a symbolic center of the universe at this place of extraordinary ritual significance.

Non-structural poles have been identified infrequently south of the Arkansas River valley, but some evidence suggests that they existed. At the A.C. Saunders site along the Neches River in Anderson County, Texas, several postholes were found in the levels *above* a large circular structure (Jackson 1936:150-153). These holes were arranged in no identifiable order in contrast to the other postholes at this site. They were dug at an angle of 50 to 60 degrees, suggesting that insertion ramps were necessary in order to raise these particular poles. A nearby mound of compact ash indicates that this site was not used only for domestic purposes. Based on the large quantity of ash and animal bones at A.C. Saunders, the upper-level poles might be interpreted similarly to those at certain Woodland sites where poles were used to display food for feasts (Knight 2001). Although the exact use and meaning of these poles is uncertain, their presence demonstrates that non-structural poles were probably used for ceremonial purposes in the southern Caddo area as well as in the Arkansas Valley.

Poles have had a great deal of significance to the Caddo people not only in the past but also quite recently. Cecile Elkins Carter, a Caddo elder and one of the first Tribal Historic Preservation Officers in the county, wrote of *Itcha kaa-nah,* or “that kind of pole”.

She wrote:

> “Grandpa and Grandma White Bread made the pole from the heart of a tall, straight, cedar tree before Grace was born. At least twenty feet tall, the tree was black on one side, green on the other. When there was a Ghost Dance or some other special reason to use the pole, it was erected with the black side facing north and the green side facing south … Grace was born in 1900, and from earliest childhood she knew of the power of the pole. Strength came from the pole and “whatever else they had on the pole … According the Grace, the government took away the Ghost Dance in 1914, but the pole continued to be used whenever there was a need” (Carter 1995:92-96).

People accorded great power to the pole. With prayer, dance, and song, men who came to the pole were healed, could sometimes see the future, and brought rain to save the crops.

Itcha kaa-nah was clearly accorded animacy, or its own life-force. Animism may have also informed the ancestral Caddo’s feelings about earlier poles and possibly the buried structures. Animism has been defined as “an ontology in which objects and other non-human beings possess souls, life force and qualities of personhood” (Brown and Walker 2008:297, drawing on Tylor 1958[1871]). People studying animacy and materiality often write of the “agency” of objects, in which objects have the capacity to influence humans’ actions (Brown and Walker 2008; Gosden 2005; Mills and Ferguson 2008). This is distinct from human agency (as defined by Sewell 2005), which implies human intention and creativity. Undoubtedly, however, both animistic and ordinary objects embedded in social and cultural relations have the power to influence human feelings and behavior. Bundles are an excellent example of animistic objects (Zedeño 2008). Additional examples might include relics in Catholic churches and other religious objects such as books of sacred writings.

Several postholes were present in the upper levels of two of the mounds at Woods. These posts must have been put in place either during or after mound construction. They could have functioned similarly to the poles at Craig Mound, creating a connection between the past and the present or between different cosmological realms or similarly to Woodland poles across the Southeast used for displaying food for feasts. They also could have been used similarly to the historic Caddo poles, for spiritual communication and guidance (Bolton 1987:156; Carter 1995:92-96). We do not know if the Woods was still used after the structures were capped with mounds, but perhaps people still visited this sacred location with its mounds and poles.

At both Woods and Biggham Creek, constructing mounds over structures closed out the use of important ceremonial spaces, permanently marking them as sacred places on the landscape. It is entirely possible that the sites were still in use after the mounds were built, but burial of the structures certainly completed one stage in the history of those places. Although the sites were used during different periods of time and hosted different sets of activities, both were treated as significant places that deserved remembrance.

Models of Leadership in Ritual Contexts

Along the Mountain Fork, the best places to look for leadership are in ritual contexts, and the most obvious places of ritual activity were at Woods and Biggham Creek where mounds were built over structures. In order to develop models of leadership for these places, we need to consider a) evidence for inclusive versus exclusive activities at these sites and b) evidence for social differentiation and hierarchical differentiation either within the site or between that site and other places. This means that we need to consider the social contexts of mound construction and the activities that occurred at the site other than mound construction. The character of pottery assemblages, faunal materials (sadly absent along the Mountain Fork), and prestige goods (or the lack thereof) are all useful for this inquiry.

As discussed in Chapter 2, other sites in the Southeast have recently been interpreted as places where leadership was expressed through ritual activity (Brown 2006; Cobb and Nassaney 2002; Maxham 2000; Welch 2006; Wilson 2008). Clans, sodalities, households, kin groups, and social houses have all been suggested as forms of corporate groups that may have drawn on ritual sponsorship more than on economic control as a basis for establishing leadership. Inclusive rituals have been modeled as integrative activities through which communities reinforced social ties. In particular, when evidence for hierarchy is sparse, mound sites and other ritual places (including non-mound “anomalous rural settlements” in the American Bottom) have been interpreted as places for community ritual rather than as administrative centers. Researchers beyond the Southeast have also been working on such models, including such places as Tibes in Puerto Rico (Torres 2010). Archaeologists have discussed how leaders may have used these community rituals in order to enhance their own status, both by sponsoring these activities in their own residential localities, thereby associating their homes with sacred places, and by emphasizing their connections to significant stories, ancestors, and cosmological powers (Brown 2007; Lindauer and Blitz 1997; Knight 2001; Steponaitis 1986).

The process of mound construction, especially for large platform mounds, has often been distinguished from how mounds are used or appropriated after construction. The process of mound construction is almost universally seen as a socially-integrative activity involving the efforts of a whole community (Cobb and King 2005; Lindauer and Blitz 1997; Steponaitis 1986). It may be that in some situations only a select group of people engaged in mound construction however, thus making the activity more exclusive. The proceedings might also be characterized by social differentiation if an elite leader was in charge of mound construction but did not directly participate in the physical labor. It is difficult to test these scenarios archaeologically. Regardless, for the people involved in mound construction the experience undoubtedly fostered feelings of integration among themselves.

Different social relations might apply post-construction than during construction. After a socially-integrative period of construction, a particular faction might appropriate the mound summit, creating an exclusive space. This was likely the case for Mississippian mounds with structures on their summits. When platform mounds first appeared during the Middle Woodland period, they lacked summit structures although many postholes were uncovered on their summits (Knight 2001; Mainfort 1988). Knight (2001) has interpreted these as evidence for food collection or display prior to a feast, which would have been socially-integrative affairs, although the host community might have gained prestige and influence.

As Maxham (2000) and Welch (2006) have noted, ritual practices did not always go hand in hand with mound building across the Southeast. Some places that otherwise look like residential sites have evidence of greater ritual activity, including high serving-to-cooking vessel ratios, distinct faunal assemblages (for example, a large and diverse assemblage of birds at 1TU66 in Alabama [Maxham 2000]), items that could have been part of sacred bundles or other ritual paraphernalia, different architectural forms, larger vessels, and more highly-decorated vessels. Maxham (2000) interpreted some residential sites with greater levels of ritual activity as places where the resident kin group sponsored community gatherings, indicating relatively high-status for the kin group but little direct political control.

Welch (2006) looked to ethnographic analogy to explain the ritual practices in residential contexts, noting that among the Dhegiha Sioux house-based rituals were conducted by members of certain sodalities. This suggests that material correlates for ritual activities in a structure, when there is no evidence for hierarchical differentiation, might indicate the presence of a ritual specialist within a household and sodalities within that society. This type of ritual specialist might be analogous to the position of *conna* among the historic Caddo. As interpreted from the Spanish records, the *conna* did not hold high-ranking positions within the leadership hierarchy, although they may certainly have accrued significant status individually. The Caddo *xinesi*, on the other hand, was considered a high-ranking official. The home or home and temple complex of a xinesi would be far more likely to contain material correlates of his hierarchical position, including more finely-made or exotic goods.

Historical accounts from the late seventeenth into the eighteenth centuries indicate that the Caddo held numerous socially-inclusive festivals and ceremonies throughout the year. These included a forecasting ceremony in the winter, athletic festivals in the spring, first fruits ceremonies in the summer, and harvest festivals (Bolton 1987:138-169). People also came together to build houses, plant fields, hold councils, and mourn the dead (Swanton 1996). Food, along with dancing, was an integral part of these gatherings. For example, at one harvest festival women from each house brought food in “a pot or small vessel” that was then compiled into larger vessels, before being distributed to elders and other leaders (Swanton 1996:228, from Espinosa 1927:171-174). Among the Hasinai, house building was a communal activity, with labor provided by the community and food provided by the family whose new house was under construction (Bolton 1987:114,155). Among the Caddo today, as among most societies around the world, food is ubiquitous at social functions including dances and funerals. Feasting, dancing, rituals, and spirituality were (and are) all interrelated, as demonstrated in the following passage:

> “The caddi takes something of everything and throws a portion into the fire, a portion on the ground, and a portion to each side. Then he retires to a corner; and while all the others form ready to dance, he speaks – first to the corn, asking that it allow itself to be eaten” (Swanton 1996:174, from Casañas 1927:212-213).

Ritual activities among the Caddo also included more exclusive ceremonies. The *xinesi* was the main historical arbiter between the people and the spiritual world (Swanton 1996:217-218, from Casañas 1927:290-293). He cared for a small building that housed the *coninisi*, or two children, through whom he communicated with the *Ayo Aymay*, interpreted by Casañas as the “great captain” or “God”. No one but the *xinesi* was ever permitted to see the *coninisi*. The *xinesi* also presided over a “fire temple”, where a fire was perpetually kept. Here he was sometimes joined by other leaders and elders to discuss political issues in council. Sometimes these more exclusive ceremonies were held in tandem with larger social gatherings.

Based on these studies of ritual places in the Southeast and on ritual practices among the historic Caddo in particular, we can set up expectations of material correlates for leadership in ritual contexts among the ancestral Caddo, looking for evidence of inclusion versus exclusion and for status differentiation. As discussed before, mound construction was likely inclusive in that a group of people worked together to build a mound, creating or reaffirming a sense of social integration among that group. Those working on the mounds could have been socially differentiated from the broader society, though, set apart through their participation in an important ritual activity. Conversely, the workers could have been socially differentiated from those directing mound building, who may have had a higher status. This is hard to test archaeologically.

The use to which mounds were put after construction is more indicative of inclusion versus exclusion. Platform mounds topped by structures likely indicate the appropriation of sacred space by a particular faction, suggesting a society characterized by a hierarchical form of sociopolitical organization. Other architectural forms in the Caddo area implying exclusion are structures with extended entranceways, which symbolically set the people within those structures apart from those outside (Brown 1996; Jelks and Tunnell 1959; Perttula 2009; Sabo 1998). In contrast, platform mounds that were not topped by enclosed structures more likely indicate more inclusive uses of the mound space, such as gathering and displaying food prior to a community feast, suggesting a society characterized by less entrenched hierarchy.

Caddo buried structure mounds, by themselves, do not imply inclusive or exclusive activities or functions. Rather, as discussed earlier, they mark the presence of memorable places where ritual activity occurred. Instead we need to focus on the activities at sites with buried structure mounds in order to determine the character of those ritually-significant sites and the broader character of sociopolitical organization in the society.

More inclusive and integrative activities at ritual sites might include outdoor social activities that are open to public view, feasting, and dancing. A ritual site characterized by exclusion, on the other hand, would be characterized by less social gatherings and more activities that are indoors or otherwise hidden from public view. Material correlates for social gatherings of dispersed communities (such as those present along the Mountain Fork) that included food consumption would include pottery assemblages with proportionately more vessels for food transportation and cooking. We might also see evidence for temporary shelters of the sort that would be constructed around a dance ground or used to gather and display food. The presence of more permanent structures at a ritual site, on the other hand, would imply that a) the site was used for residential as well as ritual purposes or b) that other activities were being conducted that were hidden from public view. The latter could include a council meeting or hidden religious rituals. If held in the same place as social gatherings, either would indicate an element of exclusion in an otherwise inclusive environment. On the other hand, private activities in a ritual context in the absence of large social gatherings suggests that the ritual place was truly exclusive in nature and that the ritual specialist who presided over that place may have been segregated from the rest of society.

If a ritually-significant site was characterize by exclusion, set off from the general population, then the person managing that site would have also been differentiated from the rest of the community. Material correlates of that status differentiation would likely include objects with symbolic meaning or iconographic content that might also play a role in ritual activities. If the ritual specialist had a higher status than other members of the community, then more prestige goods and finely crafted objects could also be present at the site than at others. This would imply a society in which leadership was centralized (at least in the numinous sphere) and characterized by some degree of sociopolitical hierarchy.

A ritual site characterized by more inclusion, on the other hand, especially one which lacked material correlates of status differentiation for any full-time inhabitants, implies that that leadership of ritual activities was not specialized. This suggests that a society characterized by more decentralized leadership and a less hierarchical sociopolitical structure.

Next we turn to the Woods and Biggham Creek, to compare these expectations to the evidence. At one end of the scale, more evidence for inclusive and integrative activities at a ritually-significant place combined with little evidence for status differentiation or hierarchy would imply the presence of a society with decentralized leadership, probably organized as a loose confederation of communities. On the other hand, more evidence for exclusive activities combined with more evidence for status differentiation and hierarchy implies that the society had more centralized leadership and was more hierarchically organized.

Interpreting Woods and Biggham Creek

Woods and Biggham Creek were both ritually-significant places as indicated by the presence of buried structure mounds. In other ways, however, they were extremely different. Their position on the landscape, internal structural features, and the character of their assemblages vary tremendously, implying that different organizational principles and activities structured the formation of each site. It is also important to remember that whereas Woods was in use from around A.D. 1300 to 1450, Biggham Creek was in use from around A.D. 1450 to 1600 (at the latest). The two sites present snapshots of ritual contexts during different periods of occupation along the Mountain Fork. Any differences that can be inferred in leadership imply changes in sociopolitical organization over time.

Woods

Woods was situated on a bluff that stood 18 meters over the bottomlands. This would have given people there a commanding view, but seems somewhat inconvenient for a full-time residence because of the effort involved in trekking up and down the hill for fresh water. The eight mounds at Woods may have been arranged around an open space. Of the four mounds and structures excavated at Woods none had internal hearths, although a small pit of charcoal was present within the limits of the Mound A structure and a baked clay feature was present just outside the extended entrance of the structure under Mound B. The lack of internal hearths at Woods suggests that these structures were not meant for year-round occupation, although we do not know whether the presumed structures under the unexcavated mounds may have had hearths. Some of the structures could have played a similar role to the brush arbors constructed historically for Caddo dances to give shelter to the dancers and their families.

The Woods pottery assemblage had a relatively low proportion of fine decorated wares. Additionally, twice as many sherds from jars were found at Woods as at any other site. The orifices of jars at Woods tended to be larger than those at other sites. This may have influenced the count of jar sherds somewhat, but not enough to account for the very high proportion of jars sherds in the Woods assemblage. The large proportion of jars at Woods goes hand-in-hand with the low proportion of fine decorated wares, since those were typically bottles and bowls. I interpret the large amount of jars as evidence for large social gatherings at this site, perhaps including people who had traveled to get there. With their restricted but accessible orifices and large bodies, jars were the best Caddo vessels for transporting food without spilling it *en route*.

The pottery at Woods was relatively homogeneous between the four mounds in terms of both decorative style and temper. This suggests that a high level of social integration among the people who gathered at this site. Radiocarbon dates do not show any clear differences between when the structures were built, so it is uncertain whether the structures were used sequentially or contemporaneously. One major difference between the mounds is that much less pottery was present in Mound B, which also covered the only structure with a distinct extended entrance. By weight, fewer lithic artifacts were also found at Mounds B and BB than at the other mounds and no hafted bifaces were found in Mound B (Figure 7.1; Table 7.1).

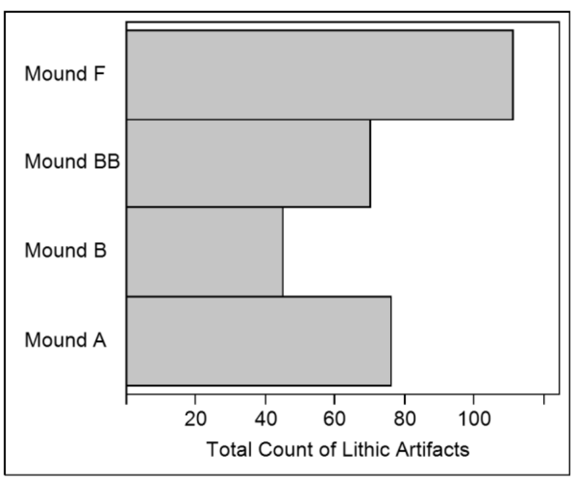

Figure 7.1. Total count of all lithic artifacts recovered in mound excavations at Woods.

Table 7.1. Count of lithic artifact types found in mound excavations at Woods.

Lithic Artifact	Mound A	Mound B	Mound BB	Mound F	Total
Groundstone	2	0	1	0	3
Graver	0	0	1	2	3
Point tip	5	0	1	4	10
Hafted biface	22	0	6	54	82
Unhafted biface	14	6	21	16	57
Biface Fragment	2	1	4	16	23
Core Tool	3	0	5	0	8
Core	2	6	3	2	13
Flake Tool	12	3	7	6	28
Flake	9	28	12	4	53
Debris	5	1	10	7	23
Total	76	45	70	111	302

The structure under Mound B, with its extended entrance and paucity of artifacts, seems to have been particularly significant. Debris produced here was cleaned away before the structure was buried. The extended entrance implies that exclusive activities took place here, hidden from the broader community. On the other hand, the Mound B structure was not set apart from the others at the site, at least so far as we know without access to more details on the chronological sequence of site construction.

I interpret Woods as a place where dispersed communities came together for social gatherings, to celebrate festivals, participate in important rituals, and visit with friends and family. While they were there, leaders gathered to discuss any issues affecting the broader community. The society appears to have been socially close-knit, and leadership was relatively decentralized and non-hierarchal. The location of Woods could have been chosen for a number of reasons. It was a central place on the landscape during its period of occupation, with non-mound sites to the north and south.

This may have made it an ideal gathering place for the broader community. Nobody would have had to travel more than about 15 kilometers to get there. Its location on a bluff may have also had symbolic significance.

Biggham Creek

The features, location, and artifacts at Biggham Creek suggest that a different set of activities took place here than at Woods. Like the non-mound sites along the Mountain Fork, Biggham Creek was located on a terrace, with easy access to water. Internal hearths were found within the limits of each of the two buried structures, which could be interpreted as evidence for more permanent occupation here than at Woods. The chipped- and ground-stone assemblage looks similar to that of other site, implying residential use.

Regarding pottery, the Biggham Creek assemblage had a significantly high proportion of fine decorated wares compared to the other Mountain Fork sites. These wares, including Avery Engraved, Simms Engraved, and Hudson Engraved vessels, were both finely made and were decorated with elements that were almost certainly symbolically significant. Mound A at Biggham Creek also contained part of an effigy vessel, which could have been a ceremonial object imbued with more symbolic meaning or iconographic content.

Unlike at Woods, the Biggham Creek pottery assemblage contained a similar proportion of vessel forms as other sites in the valley. This suggests that fewer large social gatherings took place at Biggham Creek than at Woods. Overall, Biggham Creek appears to have been a more exclusive place. Some potentially socially-integrative activities took place here, including building structures and mounds. In general, though, the site was more isolated from the larger community. The pottery also suggests that status differentiation existed between the residents of this site and their contemporaries at other sites, although the comparisons between the pottery assemblages may be skewed by the chronologically-mixed assemblages at Beaver and E. Johnson.

The Biggham Creek features and artifact assemblage reflect both domestic and ceremonially-oriented activities. This implies the presence of a ritual specialist and perhaps his family, although the lack of any midden deposit suggests that only a very small number of people may have lived here. I interpret Biggham Creek as the residence of a leader who probably played a similar role as the historic *xinesi*, mediating between his community and the numinous realm (Sabo 1998). One of the structures at Biggham may have been a residence for the family of the leader and the other structure may have been distinctly for religious purposes, such as temples recorded at numerous Caddo communities historically (Swanton 1996:216). The evidence from Biggham Creek accords fairly well with this interpretation. In the early eighteenth century, Espinosa (1927:160-162, in Swanton 1996:213-214) noted that there was always a fire going in the house of the *xinesi*. He also spoke of sacred items in the temple including “vessels of black wood … all curiously worked and having four feet” that depicted ducks or lizards, feathers, and musical instruments. The *xinesi’s* residential locality would have included a structure with an internal fire, domestic articacts, and more specialized and symbolically-invested ceremonial items. All of these characteristics are present at Biggham Creek. It is also possible, however, that Biggham Creek was only visited occasionally by a ritual specialist (or specialists), who otherwise resided with a larger community such as that at Beaver or E. Johnson.

The presence of a ritual specialist possibly akin to a *xinesi* within the Mountain Fork society at this time suggests that leadership was becoming more centralized. It is difficult to say whether sociopolitical organization was becoming more hierarchical, but it is likely that the ritual specialist's kin group accrued status through that position, or that high status assisted him to achieve that position to begin with. Although we do not know how much control this ritual leader exerted over the phenomenal political realm, the presence of this specialized position indicates that one kin group was able to achieve enough status to declare themselves arbiters with the spiritual realm.

Historic accounts of the *xinesi* suggest that his residential-ceremonial complex was sometimes on the periphery of the community, away from other residential compounds (Wyckoff and Baugh 1980). Livingood (2011) suggests that this might help to explain the discrepancy between central-place models of mound site placement that are commonly used in other parts of the Southeast, on the one hand, and the more regularly spaced Caddo mound sites, on the other. The ritual specialist at Biggham Creek may have chosen to live on the periphery of the broader Mountain Fork community. Choosing a place on the southern end of the valley may reflect the community's increasing affiliation with other McCurtain phase communities to the south, along the Little and Red Rivers.

Broader Trends

During the fifteenth century the Mountain Fork basin witnessed a significant shift in leadership and social organization as expressed in ritual contexts. The earlier period between approximately A.D. 1300 and 1450 was characterized by socially-integrative, inclusive activities at the major ritual site, with no evidence for social differentiation. After around A.D. 1450, the old ritual site at Woods was abandoned and a new ritual place was founded at Biggham Creek. This site was likely the home of a ritual specialist and his family, indicating that leadership within the Mountain Fork society was becoming more centralized and specialized. This shift was accompanied by the abandonment of sites in the northern part of the Mountain Fork and by a new focus on affiliating with societies to the south.

These changes in social organization along the Mountain Fork coincided with several trends in other parts of the Caddo area. Perttula (2012) recently summarized some of these inter-related trends, which include the intensification of maize production, migrations out of agriculturally-marginal areas, and the development of more densely populated communities along major river valleys. It was these denser, more hierarchically-organized communities that were visited by the Spanish and French in the late seventeenth and early eighteenth centuries.

Perttula (2012) suggests that the intensified focus on agriculture was related to local and regional manifestations of the period sometimes referred to as the Little Ice Age. This climatic era in the regions surrounding the North Atlantic was characterized by colder conditions overall, but more significantly by increased variability of climate including prolonged multiyear cold spells (Mann 2002:504). The Little Ice Age was not a synchronous event, but instead varied regionally with cold periods occurring between the thirteenth and nineteenth centuries (Mann 2002:506).

Perttula (2012) notes that the maize-producing Caddo communities along the middle Red River faced major droughts and cool years between ca. A.D. 1430 and 1470. He uses the Palmer drought severity index as reconstructed from tree rings in the Texarkana area of the Red River, but this data set is very similar to those from both southeastern Oklahoma and central Arkansas (Tree-Ring Lab 2012). These data sets also point to a series of cold years between ca. A.D. 1350 and 1400. Using this regional climatic data, Perttula (2012) proposes that these conditions may have encouraged the Caddo to move out of agriculturally-marginal regions such as the Ouachita Mountains and into valleys better-suited to agricultural economies, with broader floodplains and richer soils, such as those found along the Red River and other drainages in East Texas.

Although we cannot test whether maize production actually intensified along the Mountain Fork during this period, prior to the post-A.D. 1500 abandonment of the valley, we can hypothesize how these communities may have responded to more difficult or uncertain growing conditions. The three sites with major occupations post-A.D. 1400/1450 are today under Broken Bow Lake, so we cannot return to acquire soil samples for paleobotanical analysis. The Ramos Creek data, however, does show that maize production was an important component of subsistence practices, even along the northern part of the Mountain Fork. It is entirely possible the Mountain Fork Caddo were affected by poor yields during drought years and coalesced in the southern part of the valley in order to take advantage of wider terraces and bottomlands. Even in the southern part of the valley, though, any intensification of maize production was severely constrained by the relatively small amount of land available and by limited soil fertility, both of which likely exacerbated any periods of shorter and dryer growing seasons. As Caddo farmers sought to make the most out of available lands to increase crop production in order to make up for volatile yields, they may have worn out the land even faster. Poor maize yields during certain years may also have prompted increased trade with societies to the south, who may have experienced marginally better conditions because of their access to more farmland.

After the Mountain Fork communities coalesced in the southern part of the valley around A.D. 1450, maize production may have risen (especially during years with longer and wetter growing seasons) and become more intense through the efforts of a denser population. This could have contributed to the development of more specialized leadership positions, as seen at Biggham Creek, because more surplus food was available to support specialized positions. Eventually, by around A.D. 1600, the Mountain Fork Caddo left their valley, possibly because of the cumulative effects of climatic variability and nutrient-poor farmland. They most likely migrated to the Little River or the Red River to the south, joining other communities that eventually coalesced into the historic Kadohadacho confederacy, one of three confederacies ancestral to the contemporary Caddo people.

Changes in ritual activity, population movements, and sudden changes in the direction of regional interaction seen among the Mountain Fork communities appear to have been paralleled in neighboring regions. To reiterate, at least three of these shifts took place among the Mountain Fork Caddo. First, ritual activities that culminated in mound construction only began along the Mountain Fork around A.D. 1300 at Woods Mound Group. Before this the only evidence for a structure potentially associated with ritual activity was Structure 1 at Beaver. Second, around A.D. 1450, the population shifted towards the southern part of the valley, started interacting less with the Ouachita Mountain communities to the east and more with the Little River and Red River communities to the south, and moved their ritual focus to Biggham Creek. Finally, sometime after A.D. 1500/1600, permanent Caddo occupation along the Mountain Fork ceased.

Looking first to the east, the Upper and Middle Ouachita Valley also experienced a fluorescence of mound construction during the Middle Caddo period, accompanied by an upsurge of new regional pottery styles (ca. A.D. 1300-1500; Early 1982, 2002b). The Upper Ouachita Valley, represented by Buckville phase sites including Adair, Poole, and Standridge, experienced its most intense occupation during this period (Early 1981, 1982, 1988) and appears to have been abandoned between A.D. 1500 to 1600, although further research is necessary to refine these dates (Ann Early, personal communication 2012). Likewise, sites in the Little Missouri drainage, including the Ozan Creek sites, seem to have flourished during the Middle Caddo period, but the lack of European-derived objects or many late pottery types implies abandonment by around A.D. 1600 (Bohannon 1973; Harrington 1920). The abandonment of the Upper Ouachita and Little Missouri may partially explain the ca. A.D. 1450 shift in regional affiliation of the Mountain Fork Caddo: simply put, their former trade partners were no longer present. The Little River region just south of the Little Missouri saw some use during the sixteenth century, but permanent residence and ceremonial activity decreased (Bohannon 1973:13-14; Hoffman 1983; Perttula 1992:126-127).

The Middle Ouachita Valley, much further to the east, saw more continuity of occupation from the Middle to Late Caddo periods, with the greatest density of sites focused in around Saline Bayou (Early 1993:2). As the name implies, salt springs may have been a driving factor for settlement here. Additionally, this region spanned the border between the Ouachita Mountains and the Western Gulf Coastal Plain, with its landscape characterized more by rolling hills and broader alluvial valleys that would have allowed for more intense farming than among the mountains. This region experienced a change in extra-local interaction later than the Mountain Fork communities, and probably for a different reason. Towards the end of the Social Hill phase (ca. A.D. 1500-1650), pottery from the Middle Ouachita region started showing up in the Arkansas Valley, and by around A.D. 1700, during the Deceiper phase, Arkansas Valley pottery was showing up at Middle Ouachita sites (Early 2002a,d). Early (2002a,d) suggests that this likely was related to social and economic changes catalyzed by the DeSoto *entrada* and other European incursions into the area.

Going back to the Mountain Fork communities' migration towards the south post A.D. 1500, some sites in the western Little River Valley, including A.W. Davis and McDonald, were almost certainly occupied into the 1500s. The pottery types at A.W. Davis are dominated by the some of the same late types seen at Biggham Creek, including Hudson Engraved, Avery Engraved, and Simms Engraved (Dowd 2011c). Some of these types, along with spool-neck bottles, are also present at McDonald. Interestingly, the Hudson Engraved bottles at these two sites are trailed and incised, rather than engraved, just like the examples from the Mountain Fork, suggesting close ties between these communities during this time frame. No evidence in the form of European items exists along the western Little River for Caddo occupation into the period of prolonged European contact, suggesting that these communities, along with the Mountain Fork communities, migrated south to the Red River.

Along the middle Red River occupations existed during the entire Caddo period and into the historic period. Some of the best-known Late Caddo and early historic sites from this stretch of the river include Roitsch/Sam Kaufman, Williams, Roden, Rowland-Clark, and Holdeman (Perino 1981, 1983, 1994, 1995; Perttula 2008a; Skinner et al. 1969). Perttula (2008a:481) notes that based on our present knowledge of site distribution, Early and Middle Caddo period occupations were concentrated into only a few localities, whereas Late Caddo occupations were more broadly dispersed across the landscape in a manner similar to that seen in the Teran map. This change in settlement distribution provides some support for an increase in both population density and in maize farming along the Red River during the Late Caddo period. As maize farming intensified, salt processing, together with better and more farmland, might have also attracted the Mountain Fork and Little River Caddo towards the Red River, based on the presence of salt-making sites in the vicinity of Salt Well Slough near the Roitsch/Kaufman site (Perttula 2008a:484).

Stepping further back in time for one moment, a major question remains unanswered regarding the reasons behind initial expansion of mound construction and the florescence of pottery styles among the Ouachita Mountains around A.D. 1300 to 1400. At least one major line of evidence, architectural style, points to the Arkansas Valley as one avenue of inquiry. As Early (2000:128-129) has noted, the two-post rectangular building style seen at Winding Stair, Standridge, and Adair among the Ouachita Mountains is very similar to the Ft. Coffee phase houses of the Arkansas Valley to the north. This house style is also seen at Ramos Creek, Woods, and Beaver. The probable four-post square structure at Woods suggests a potentially even earlier link to the Spiro phase people of the Arkansas Valley.

Wyckoff (1981) and Brown (1996:199-200) have both discussed the potential for some of the Arkansas Valley population to have drifted southward into the Ouachita Mountains because of prolonged drought conditions on the Southern Plains during the Pacific Climatic Episode. Other Arkansas Valley communities, on the other hand, may have moved onto the Plains adapting to bison hunting. Regardless of what exact conditions, climatic or social, influence migration patterns, certain similarities in material culture including architecture, some pottery styles, and the presence of

Ouachita Mountain lithic materials at Spiro indicate that at least some of the Arkansas Valley residents maintained ties with the Ouachita Mountain communities. If some Arkansas Valley residents migrated into the Ouachita Mountains, joining pre-existing communities along the Ouachita River, Mountain Fork, and other drainages, this melding of communities may have spurred innovation in the region including a wave of mound construction and increased creative expression in pottery design.

In sum, the archaeology of Mountain Fork Caddo illuminates a period of dynamic change for this society between A.D. 1300 to 1600. Contrasts between the two major ritual venues in this valley, Woods and Biggham Creek, show that social practices in these ritual contexts shifted over time. Whereas Woods was characterized by inclusive social gatherings, the exclusive nature of Biggham Creek demonstrates that leadership became more specialized and centralized. The shifts in settlement location and regional interaction that accompanied this change in the use of ritual sites were likely related to broader trends, including climatic uncertainty, the intensification of maize farming (possibly to account for anticipated shortfalls), and increased extra-local interaction. I conclude by discussing the broader implications of this study and how it informs the theoretical discussions of complexity in small-scale societies.

Conclusion

Archaeologists studying complex societies are often attracted the largest sites with the most spectacular political-religious complexes and exquisitely-crafted artifacts. Most human societies throughout the breadth of history, however, have been smaller in scale, leaving less visible material traces on the landscape. By delving into the intricacies of interpreting sociopolitical dynamics in small-scale societies we not only develop detailed local histories of particular societies, but also enhance our understanding of the variable contexts in which status differentiation, ranking, and sometimes institutionalized social inequality emerge.

The ritual venues in which leaders enhance or justify their status and power are important contexts for studying the intersection of social practice, political organization, and leadership strategies. This is relevant to contemporary concerns, because we see leaders at every level of society around the world today appeal to ideology and religion to justify their visions. Appreciating the role of ideology in the dynamic interplay of agentive, social, environmental, and historic factors that shape societies is critical for understanding the reasons for people's beliefs and behavior. By conducting archaeological studies of societies of all different sizes and states of complexity, we increase our knowledge of the variable interplay of factors shaping sociopolitical dynamics and increase our potential for recognizing common patterns that help explain ancient and modern historical trajectories.

This project expands our understanding of small-scale societies through the development of a detailed model of sociopolitical dynamics for the ancestral Caddo communities living along the Mountain Fork from approximately A.D. 1000 to 1600. Examining social practices at two ritual venues, the mound sites of Woods and Biggham Creek, showed that a shift in sociopolitical organization occurred in this society during the fifteenth century. Woods (ca. A.D. 1300-1450) was interpreted as the site of large, socially-integrative gatherings characterized by little status differentiation and decentralized, relatively non-hierarchical leadership. Biggham Creek (ca. A.D. 1450-1600), on the other hand, was a more exclusive place with some evidence for status differentiation, suggesting that leadership was becoming more specialized and possibly hierarchical. This shift in sociopolitical organization was accompanied by the abandonment of sites in the northern part of the Mountain Fork and by increasing affiliation with societies to the south, which may have been related to changes in the intensity of maize production and climatic uncertainty. Although sociopolitical organization was changing, the Mountain Fork Caddo continued the deep-seated practice of ritually burying structures and creating earthen mounds at least through A.D. 1500. Ritual places did not cease being important venues for leadership; rather, leaders adjusted to changing social circumstances and filled new niches in relation to ritual practice and political leadership.

Earlier models encouraged archaeologists to interpret mound sites as nodal elements in a hierarchical settlement pattern, reflecting ranked relationships between communities. This study, on the other hand, contributes to a growing body of literature that challenges the overemphasis of hierarchy at the expense of studying the multiplicity of social and political roles and relationships in small-scale societies. It makes a major contribution in demonstrating that sites with more mounds in the Caddo area do not necessarily imply that a more hierarchical mode of sociopolitical organization was in place. Instead, the site with more mounds in this study, Woods, was actually interpreted as representative of a less hierarchical sociopolitical structure than the site with less mounds, Biggham Creek.

Local and regional settlement patterns together with the activities practiced at particular sites need to be carefully studied in order to develop particular historical interpretations for mound sites and their surrounding communities. Broader forces, including climatological trends and external events, certainly influence local trajectories. We cannot understand how those influences will affect different societies, though, without a detailed picture of those societies' social histories. To that end, this study used a fine-grained analysis to create a detailed interpretation of the archaeological history and sociopolitical dynamics of the Mountain Fork Caddo.

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Appendix A. Carbonized and semi-carbonized macrobotanical remains from Ramos Creek. All recovered by flotation except Lot 448.3, which was hand-collected. (Bush 2011:Table B.5).

Liters processed	Feature type	Feature	Lot number(s)	Plant part	Botanical name	Common name	Count	Weight (g)
4	FCR cluster	2	315	Bulb scale	Indeterminable	Indeterminable	2	0.01
4	FCR cluster	2	315	Indeterminable			2	0.01
4	FCR cluster	2	315	Leaf			1	0.01
4	FCR cluster	2	315	Nutshell	*Carya* sp.	Hickory	4	0.05
4	FCR cluster	2	315	Nutshell	*Quercus* sp.	Acorn	1	0.01
4	FCR cluster	2	315	Wood	*Quercus* subg. *Quercus*	White group oak	2	0.01
4	FCR cluster	2	315	Wood	*Carpinus caroliniana*	American hornbeam	1	0.01
4	FCR cluster	2	315	Wood	Hardwood	Hardwood	1	0.01
4	FCR cluster	2	315	Wood	*Liquidambar styraciflua*	Sweetgum	1	0.01
10.5	Post mold	4	346, 347	Bark			11	0.16
10.5	Post mold	4	346, 347	Bulb scale			2	0.01
10.5	Post mold	4	346, 347	Indeterminable			44	0.20
10.5	Post mold	4	346, 347	Nutshell	*Carya* sp.	Hickory	144	1.39
10.5	Post mold	4	346, 347	Nutshell	Juglandaceae	Hickory/walnut family	21	0.11
10.5	Post mold	4	346, 347	Nutshell	*Quercus* sp.	Acorn	25	0.08
10.5	Post mold	4	346, 347	Rachis	*Zea mays*	Corn	4	0.02
10.5	Post mold	4	346, 347	Seed	*Zea mays*	Corn	1	0.02
10.5	Post mold	4	346, 347	Seed	Indeterminable	Indeterminable	2	0.01
10.5	Post mold	4	346, 347	Seed	*Polygonum erectum*	Knotweed	1	0.01
10.5	Post mold	4	346, 347	Seed	*Chenopodium/Amaranthus* spp.	Cheno/am	1	0.01
10.5	Post mold	4	346, 347	Wood	Indeterminable	Indeterminable	2	0.03
10.5	Post mold	4	346, 347	Wood	*Quercus* subg. *Lobatae*	Red group oak	11	0.19
10.5	Post mold	4	346, 347	Wood	*Quercus* subg. *Quercus*	White group oak	5	0.08
10.5	Post mold	4	346, 347	Wood	*Pinus* sp.	Pine	2	0.02
10.5	Post mold	4	346, 347	Wood	Not examined	Not examined	145	0.61
26.5	Pit	5	314, 386, 394	Bark			1	0.03
26.5	Pit	5	314, 386,	Fungus			2	0.01

Liters processed	Feature type	Feature	Lot number(s)	Plant part	Botanical name	Common name	Count	Weight (g)
			394					
26.5	Pit	5	314, 386, 394	Indeterminable			105	0.80
26.5	Pit	5	314, 386, 394	Nutshell	*Carya* sp.	Hickory	316	4.99
26.5	Pit	5	314, 386, 394	Nutshell	Juglandaceae	Hickory/walnut family	46	0.21
26.5	Pit	5	314, 386, 394	Nutshell	*Quercus* sp.	Acorn	163	0.62
26.5	Pit	5	314, 386, 394	Rachis	*Zea mays*	Corn	419	2.11
26.5	Pit	5	314, 386, 394	Seed	*Zea mays*	Corn	2	0.01
26.5	Pit	5	314, 386, 394	Seed	Indeterminable	Indeterminable	1	0.02
26.5	Pit	5	314, 386, 394	Stem	*Arundinaria gigantea*	Cane	3	0.08
26.5	Pit	5	314, 386, 394	Wood	*Pinus* sp.	Pine	17	0.55
26.5	Pit	5	314, 386, 394	Wood	*Juniperus virginiana*	Eastern redcedar	2	0.02
26.5	Pit	5	314, 386, 394	Wood	*Quercus* sp.	Oak	1	0.02
26.5	Pit	5	314, 386, 394	Wood	Not examined	Not examined	450	8.33
26.5	Pit	5	314, 386, 394	Bark*			7	0.08
26.5	Pit	5	314, 386, 394	Wood*	*Pinus* sp.	Pine	8	0.06
14	Pit	5, N 1/2	301	Indeterminable			49	0.43
14	Pit	5, N 1/2	301	Nutmeat	*Quercus* sp.	Acorn	1	0.04
14	Pit	5, N 1/2	301	Nutshell	*Carya* sp.	Hickory	171	2.41
14	Pit	5, N 1/2	301	Nutshell	*Juglans nigra*	Black walnut	4	0.09
14	Pit	5, N 1/2	301	Nutshell	Juglandaceae	Hickory/walnut family	27	0.20
14	Pit	5, N 1/2	301	Nutshell	*Quercus* sp.	Acorn	52	0.26
14	Pit	5, N 1/2	301	Rachis	*Zea mays*	Corn	279	1.94

Liters processed	Feature type	Feature	Lot number(s)	Plant part	Botanical name	Common name	Count	Weight (g)
14	Pit	5, N 1/2	301	Rind			1	0.01
14	Pit	5, N 1/2	301	Seed	Indeterminable	Indeterminable	2	0.01
14	Pit	5, N 1/2	301	Stem	*Arundinaria gigantea*	Cane	1	0.02
14	Pit	5, N 1/2	301	Bark*			19	0.12
14	Pit	5, N 1/2	301	Wood*	*Pinus* sp.	Pine	6	0.09
34.5	Ash pit	6	344, 363, 382	Bark			75	2.17
34.5	Ash pit	6	344, 363, 382	Indeterminable			32	0.20
34.5	Ash pit	6	344, 363, 382	Nutshell	*Carya* sp.	Hickory	271	3.18
34.5	Ash pit	6	344, 363, 382	Nutshell	Juglandaceae	Hickory/walnut family	21	0.09
34.5	Ash pit	6	344, 363, 382	Nutshell	*Quercus* sp.	Acorn	22	0.06
34.5	Ash pit	6	344, 363, 382	Rachis	*Zea mays*	Corn	3	0.01
34.5	Ash pit	6	344, 363, 382	Seed	*Zea mays*	Corn	3	0.01
34.5	Ash pit	6	344, 363, 382	Seed	*Oxalis* sp.	Woodsorrel	1	0.01
34.5	Ash pit	6	344, 363, 382	Seed	Lamiaceae	Mint family	1	0.01
34.5	Ash pit	6	344, 363, 382	Tuber	Indeterminable	Indeterminable	1	0.01
34.5	Ash pit	6	344, 363, 382	Wood	*Quercus* subg. *Lobatae*	Red group oak	10	0.33
34.5	Ash pit	6	344, 363, 382	Wood	*Pinus* sp.	Pine	2	0.04
34.5	Ash pit	6	344, 363, 382	Wood	*Carya* sp.	Hickory	3	0.06
34.5	Ash pit	6	344, 363, 382	Wood	*Quercus* sp.	Oak	5	0.04
34.5	Ash pit	6	344, 363, 382	Wood	Not examined	Not examined	361	7.01
34	Hearth	7	340, 370, 371	Bark			14	0.19

Liters processed	Feature type	Feature	Lot number(s)	Plant part	Botanical name	Common name	Count	Weight (g)
34	Hearth	7	340, 370, 371	Indeterminable			15	0.11
34	Hearth	7	340, 370, 371	Nutshell	*ya* sp.	Hickory	100	0.89
34	Hearth	7	340, 370, 371	Nutshell	Juglandaceae	Hickory/walnut family	16	0.07
34	Hearth	7	340, 370, 371	Nutshell	*Quercus* sp.	Acorn	6	0.01
34	Hearth	7	340, 370, 371	Rachis	*Zea mays*	Corn	1	0.01
34	Hearth	7	340, 370, 371	Seed	*Zea mays*	Corn	4	0.03
34	Hearth	7	340, 370, 371	Seed	Galium sp.	Stick-tight	1	0.01
34	Hearth	7	340, 370, 371	Stem	*Arundinaria gigantea*	Cane	5	0.07
34	Hearth	7	340, 370, 371	Wood	*Acer* sp.	Maple	1	0.01
34	Hearth	7	340, 370, 371	Wood	*Quercus* subg. *Lobatae*	Red group oak	5	0.10
34	Hearth	7	340, 370, 371	Wood	*Pinus* sp.	Pine	1	0.01
34	Hearth	7	340, 370, 371	Wood	Hardwood	Hardwood	2	0.02
34	Hearth	7	340, 370, 371	Wood	*Carya* sp.	Hickory	1	0.01
34	Hearth	7	340, 370, 371	Wood	*Juniperus virginiana*	Eastern redcedar	2	0.03
34	Hearth	7	340, 370, 371	Wood	*Quercus* sp.	Oak	4	0.02
34	Hearth	7	340, 370, 371	Wood	*Quercus* subg. *Quercus*	White group oak	4	0.03
34	Hearth	7	340, 370, 371	Wood	Not examined	Not examined	102	0.64
1.5	Post mold?	8	390, 391	Bark			3	0.02
1.5	Post mold?	8	390, 391	Indeterminable			11	0.06
1.5	Post mold?	8	390, 391	Nutshell	*Carya* sp.	Hickory	25	0.28
1.5	Post mold?	8	390, 391	Nutshell	Juglandaceae	Hickory/walnut family	2	0.02

Liters processed	Feature type	Feature	Lot number(s)	Plant part	Botanical name	Common name	Count	Weight (g)
1.5	Post mold?	8	390, 391	Nutshell	*Quercus* sp.	Acorn	1	0.01
1.5	Post mold?	8	390, 391	Wood	*Quercus* subg. *Quercus*	White group oak	10	0.14
1.5	Post mold?	8	390, 391	Wood	dwood	Hardwood	6	0.04
1.5	Post mold?	8	390, 391	Wood	*Carya* sp.	Hickory	3	0.06
1.5	Post mold?	8	390, 391	Wood	*Quercus* subg. *Lobatae*	Red group oak	1	0.01
1.5	Post mold?	8	390, 391	Wood	Not examined	Not examined	15	0.04
1.75	Shallow pit	10	296, 399	Indeterminable			2	0.01
1.75	Shallow pit	10	296, 399	Nutshell	*Carya* sp.	Hickory	13	0.11
1.75	Shallow pit	10	296, 399	Nutshell	Juglandaceae	Hickory/walnut family	3	0.02
1.75	Shallow pit	10	296, 399	Rachis	*Zea mays*	Corn	178	1.11
1.75	Shallow pit	10	296, 399	Rachis (cob frag.)	*Zea mays*	Corn	1	0.50
1.75	Shallow pit	10	296, 399	Wood	*Carya* sp.	Hickory	1	0.01
1.75	Shallow pit	10	296, 399	Wood	*Pinus* sp.	Pine	4	0.02
1.75	Shallow pit	10	296, 399	Wood	*Quercus* sp.	Oak	3	0.01
13.5	Post mold	11	423, 429	Bulb scale			2	0.01
13.5	Post mold	11	423, 429	Indeterminable			44	0.20
13.5	Post mold	11	423, 429	Nutshell	*Carya* sp.	Hickory	119	1.25
13.5	Post mold	11	423, 429	Nutshell	Juglandaceae	Hickory/walnut family	23	0.11
13.5	Post mold	11	423, 429	Nutshell	*Quercus* sp.	Acorn	10	0.04
13.5	Post mold	11	423, 429	Rachis	*Zea mays*	Corn	4	0.02
13.5	Post mold	11	423, 429	Rind			1	0.01
13.5	Post mold	11	423, 429	Stem	Poaceae	Grass family	1	0.01
13.5	Post mold	11	423, 429	Wood	*Quercus* subg. *Lobatae*	Red group oak	4	0.21
13.5	Post mold	11	423, 429	Wood	*Carya* sp.	Hickory	14	0.40
13.5	Post mold	11	423, 429	Wood	*Quercus* sp.	Oak	2	0.04
13.5	Post mold	11	423, 429	Wood	Not examined	Not examined	546	8.30
1	Post mold	12	402	Indeterminable			9	0.04
1	Post mold	12	402	Nutshell	*Carya* sp.	Hickory	8	0.09
1	Post mold	12	402	Nutshell	Juglandaceae	Hickory/walnut family	1	0.02
1	Post mold	12	402	Wood	*Quercus* subg. *Lobatae*	Red group oak	12	0.32

Liters processed	Feature type	Feature	Lot number(s)	Plant part	Botanical name	Common name	Count	Weight (g)
1	Post mold	12	402	Wood	*Quercus* sp.	Oak	7	0.07
1	Post mold	12	402	Wood	*Carya* sp.	Hickory	1	0.02
1	Post mold	12	402	Wood	Not examined	Not examined	55	0.94
27.5	Exterior pit	13	403, 431	Bark			2	0.03
27.5	Exterior pit	13	403, 431	Indeterminable			29	0.18
27.5	Exterior pit	13	403, 431	Nutshell	*Carya* sp.	Hickory	154	1.89
27.5	Exterior pit	13	403, 431	Nutshell	Juglandaceae	Hickory/walnut family	21	0.08
27.5	Exterior pit	13	403, 431	Nutshell	*Quercus* sp.	Acorn	5	0.02
27.5	Exterior pit	13	403, 431	Rachis	*Zea mays*	Corn	1	0.01
27.5	Exterior pit	13	403, 431	Seed	Rosaceae	Rose family	1	0.01
27.5	Exterior pit	13	403, 431	Wood	*Quercus* sp.	Oak	3	0.15
27.5	Exterior pit	13	403, 431	Wood	*Quercus* subg. *Quercus*	White group oak	3	0.03
27.5	Exterior pit	13	403, 431	Wood	*Quercus* subg. *Lobatae*	Red group oak	4	0.04
27.5	Exterior pit	13	403, 431	Wood	*Pinus* sp.	Pine	7	0.05
27.5	Exterior pit	13	403, 431	Wood	*Carya* sp.	Hickory	3	0.04
27.5	Exterior pit	13	403, 431	Wood	Not examined	Not examined	138	1.10
1	Post mold?	14	406	Bark			6	0.06
1	Post mold?	14	406	Indeterminable			20	0.10
1	Post mold?	14	406	Nutshell	*Carya* sp.	Hickory	6	0.06
1	Post mold?	14	406	Nutshell	Juglandaceae	Hickory/walnut family	6	0.04
1	Post mold?	14	406	Nutshell	*Quercus* sp.	Acorn	2	0.01
1	Post mold?	14	406	Seed	*Passiflora incarnata*	Purple passionflower	1	0.01
1	Post mold?	14	406	Wood	*Carya* sp.	Hickory	18	0.26
1	Post mold?	14	406	Wood	Hardwood	Hardwood	2	0.04
1	Post mold?	14	406	Wood	Not examined	Not examined	192	1.15
1.5	Burned patch	15	416	Indeterminable			2	0.02
1.5	Burned patch	15	416	Nutshell	*Carya* sp.	Hickory	12	0.08
1.5	Burned patch	15	416	Nutshell	Juglandaceae	Hickory/walnut family	4	0.02
1.5	Burned patch	15	416	Nutshell	*Quercus sp.*	Acorn	1	0.01
1.5	Burned patch	15	416	Wood	*Quercus* subg. *Quercus*	White group oak	7	0.05
1.5	Burned patch	15	416	Wood	*Pinus* sp.	Pine	6	0.03

Liters processed	Feature type	Feature	Lot number(s)	Plant part	Botanical name	Common name	Count	Weight (g)
10	Center post	16, NW 1/2	428	Indeterminable			4	0.02
10	Center post	16, NW 1/2	428	Nutshell	*Carya* sp.	Hickory	40	0.29
10	Center post	16, NW 1/2	428	Nutshell	Juglandaceae	Hickory/walnut family	10	0.08
10	Center post	16, NW 1/2	428	Nutshell	*Quercus sp.*	Acorn	1	0.01
10	Center post	16, NW 1/2	428	Seed	*Portulaca oleracea*	Purslane	1	0.01
10	Center post	16, NW 1/2	428	Wood	Acer sp.	Maple	3	0.28
10	Center post	16, NW 1/2	428	Wood	*Carya* sp.	Hickory	4	0.06
10	Center post	16, NW 1/2	428	Wood	*Quercus* subg. *Lobatae*	Red group oak	6	0.03
10	Center post	16, NW 1/2	428	Wood	*Pinus* sp.	Pine	4	0.03
10	Center post	16, NW 1/2	428	Wood	Hardwood	Hardwood	1	0.04
10	Center post	16, NW 1/2	428	Wood	*Ilex* sp.	Holly	1	0.01
10	Center post	16, NW 1/2	428	Wood	*Quercus* subg. *Quercus*	White group oak	1	0.01
10	Center post	16, NW 1/2	428	Wood	Not examined	Not examined	8	0.03
16.5	Center post	16, SE 1/2	427	Fungus			10	0.04
16.5	Center post	16, SE 1/2	427	Indeterminable			18	0.11
16.5	Center post	16, SE 1/2	427	Nutshell	*Carya* sp.	Hickory	50	0.51
16.5	Center post	16, SE 1/2	427	Nutshell	Juglandaceae	Hickory/walnut family	18	0.10
16.5	Center post	16, SE 1/2	427	Nutshell	*Quercus sp.*	Acorn	7	0.04
16.5	Center post	16, SE 1/2	427	Seed	Unknown	Unknown	1	0.01
16.5	Center post	16, SE 1/2	427	Wood	*Quercus* subg. *Lobatae*	Red group oak	7	0.22
16.5	Center post	16, SE 1/2	427	Wood	*Acer* sp.	Maple	4	0.04
16.5	Center post	16, SE 1/2	427	Wood	*Carya* sp.	Hickory	3	0.03
16.5	Center post	16, SE 1/2	427	Wood	*Pinus* sp.	Pine	5	0.04
16.5	Center post	16, SE 1/2	427	Wood	*Quercus* subg. *Quercus*	White group oak	1	0.02
16.5	Center post	16, SE 1/2	427	Wood	Not examined	Not examined	42	0.15
3	Structure	B1 Structure	128	Bark			121	0.72
3	Structure	B1 Structure	128	Fungus			1	0.01
3	Structure	B1 Structure	128	Indeterminable			17	0.10
3	Structure	B1 Structure	128	Nutshell	*Carya* sp.	Hickory	32	0.26
3	Structure	B1 Structure	128	Nutshell	Juglandaceae	Hickory/walnut family	5	0.03
3	Structure	B1 Structure	128	Nutshell	*Quercus sp.*	Acorn	5	0.02

Liters processed	Feature type	Feature	Lot number(s)	Plant part	Botanical name	Common name	Count	Weight (g)
3	Structure	B1 Structure	128	Seed	Chenopodium/Amaranthus spp.	Cheno/am	1	0.01
3	Structure	B1 Structure	128	Wood	*Carya* sp.	Hickory	14	0.08
3	Structure	B1 Structure	128	Wood	*Quercus* subg. *Lobatae*	Red group oak	4	0.04
3	Structure	B1 Structure	128	Wood	*Pinus* sp.	Pine	2	0.01
3	Structure	B1 Structure	128	Wood	Not examined	Not examined	21	0.09
3	Structure	B1 Structure	129	Bark			13	0.13
3	Structure	B1 Structure	129	Indeterminable			21	0.09
3	Structure	B1 Structure	129	Nutshell	*Carya* sp.	Hickory	135	1.56
3	Structure	B1 Structure	129	Nutshell	Juglandaceae	Hickory/walnut family	15	0.10
3	Structure	B1 Structure	129	Nutshell	*Quercus sp.*	Acorn	28	0.09
3	Structure	B1 Structure	129	Rachis	*Zea mays*	Corn	3	0.01
3	Structure	B1 Structure	129	Wood	*Carya* sp.	Hickory	5	0.09
3	Structure	B1 Structure	129	Wood	*Pinus* sp.	Pine	8	0.06
3	Structure	B1 Structure	129	Wood	*Quercus* subg. *Quercus*	White group oak	3	0.02
3	Structure	B1 Structure	129	Wood	Hardwood	Hardwood	1	0.01
3	Structure	B1 Structure	129	Wood	*Quercus* subg. *Lobatae*	Red group oak	3	0.02
3	Structure	B1 Structure	129	Wood	Not examined	Not examined	66	0.30
8.5	Structure	B1 Structure	192	Bark			5	0.13
8.5	Structure	B1 Structure	192	Cone scales	*Pinus* sp.	Pine	1	0.29
8.5	Structure	B1 Structure	192	Fungus			3	0.01
8.5	Structure	B1 Structure	192	Indeterminable			21	0.12
8.5	Structure	B1 Structure	192	Nutshell	*Carya* sp.	Hickory	83	0.69
8.5	Structure	B1 Structure	192	Nutshell	Juglandaceae	Hickory/walnut family	13	0.06
8.5	Structure	B1 Structure	192	Nutshell	*Quercus sp.*	Acorn	8	0.02
8.5	Structure	B1 Structure	192	Seed	*Zea mays*	Corn	2	0.01
8.5	Structure	B1 Structure	192	Wood	*Quercus* subg. *Lobatae*	Red group oak	8	0.26
8.5	Structure	B1 Structure	192	Wood	*Carya* sp.	Hickory	1	0.01
8.5	Structure	B1 Structure	192	Wood	*Pinus* sp.	Pine	3	0.03
8.5	Structure	B1 Structure	192	Wood	*Quercus* subg. *Quercus*	White group oak	6	0.14
8.5	Structure	B1 Structure	192	Wood	*Acer* sp.	Maple	2	0.02

Liters processed	Feature type	Feature	Lot number(s)	Plant part	Botanical name	Common name	Count	Weight (g)
8.5	Structure	B1 Structure	192	Wood	Not examined	Not examined	367	3.16
3	Structure	B1 Structure	215	Bark			46	0.20
3	Structure	B1 Structure	215	Indeterminable			8	0.04
3	Structure	B1 Structure	215	Nutshell	*Carya* sp.	Hickory	12	0.21
3	Structure	B1 Structure	215	Nutshell	*Quercus sp.*	Acorn	1	0.01
3	Structure	B1 Structure	215	Wood	*Quercus* subg. *Lobatae*	Red group oak	2	0.02
3	Structure	B1 Structure	215	Wood	*ya* sp.	Hickory	11	0.11
3	Structure	B1 Structure	215	Wood	Hardwood	Hardwood	3	0.03
3	Structure	B1 Structure	215	Wood	*Pinus* sp.	Pine	3	0.02
3	Structure	B1 Structure	215	Wood	Vitaceae	Grape family	1	0.01
3	Structure	B1 Structure	215	Wood	Not examined	Not examined	83	0.36
6	Structure	B1 Structure	228	Fungus			4	0.02
6	Structure	B1 Structure	228	Indeterminable			20	0.11
6	Structure	B1 Structure	228	Nutshell	*Carya* sp.	Hickory	168	1.60
6	Structure	B1 Structure	228	Nutshell	Juglandaceae	Hickory/walnut family	12	0.09
6	Structure	B1 Structure	228	Nutshell	*Quercus sp.*	Acorn	23	0.07
6	Structure	B1 Structure	228	Rachis	*Zea mays*	Corn	6	0.04
6	Structure	B1 Structure	228	Seed	*Zea mays*	Corn	1	0.01
6	Structure	B1 Structure	228	Seed	Indeterminable	Indeterminable	1	0.01
6	Structure	B1 Structure	228	Wood	*Pinus* sp.	Pine	14	0.10
6	Structure	B1 Structure	228	Wood	*Quercus* subg. *Quercus*	White group oak	2	0.09
6	Structure	B1 Structure	228	Wood	Hardwood	Hardwood	2	0.02
6	Structure	B1 Structure	228	Wood	*Carya* sp.	Hickory	1	0.01
6	Structure	B1 Structure	228	Wood	*Acer* sp.	Maple	1	0.04
6	Structure	B1 Structure	228	Wood	Not examined	Not examined	122	0.56
4	Structure	B1 Structure	254	Bark			81	0.71
4	Structure	B1 Structure	254	Fungus			1	0.01
4	Structure	B1 Structure	254	Indeterminable			21	0.18
4	Structure	B1 Structure	254	Nutshell	*Carya* sp.	Hickory	55	0.73
4	Structure	B1 Structure	254	Nutshell	Juglandaceae	Hickory/walnut family	12	0.08
4	Structure	B1 Structure	254	Nutshell	*Quercus sp.*	Acorn	4	0.02

Liters processed	Feature type	Feature	Lot number(s)	Plant part	Botanical name	Common name	Count	Weight (g)
4	Structure	B1 Structure	254	Rachis	*Zea mays*	Corn	3	0.02
4	Structure	B1 Structure	254	Seed	*Zea mays*	Corn	2	0.01
4	Structure	B1 Structure	254	Seed	Euphorbiaceae	Spurge family	1	0.01
4	Structure	B1 Structure	254	Wood	*Quercus* subg. *Lobatae*	Red group oak	6	0.12
4	Structure	B1 Structure	254	Wood	*Carya* sp.	Hickory	6	0.07
4	Structure	B1 Structure	254	Wood	*Pinus* sp.	Pine	1	0.01
4	Structure	B1 Structure	254	Wood	Not examined	Not examined	159	1.40
4	Structure	B1 Structure	254	Bark*			2	0.02
4.5	Structure	B1 Structure	263	Bark			6	0.04
4.5	Structure	B1 Structure	263	Indeterminable			20	0.17
4.5	Structure	B1 Structure	263	Nutshell	*Carya* sp.	Hickory	63	0.83
4.5	Structure	B1 Structure	263	Nutshell	Juglandaceae	Hickory/walnut family	19	0.08
4.5	Structure	B1 Structure	263	Nutshell	*Quercus sp.*	Acorn	2	0.01
4.5	Structure	B1 Structure	263	Seed	*Zea mays*	Corn	2	0.02
4.5	Structure	B1 Structure	263	Wood	*Quercus* subg. *Quercus*	White group oak	12	0.15
4.5	Structure	B1 Structure	263	Wood	*Castanea pumila*	Chinkapin	1	0.01
4.5	Structure	B1 Structure	263	Wood	*Carya* sp.	Hickory	2	0.02
4.5	Structure	B1 Structure	263	Wood	*Quercus sp.*	Oak	2	0.01
4.5	Structure	B1 Structure	263	Wood	*Pinus* sp.	Pine	2	0.01
4.5	Structure	B1 Structure	263	Wood	*Acer* sp.	Maple	1	0.01
4.5	Structure	B1 Structure	263	Wood	Not examined	Not examined	107	0.49
4.5	Structure	B1 Structure	263	Wood*	*Pinus* sp.	Pine	2	0.01
5	Structure	B1 Structure	264	Bark			2	0.02
5	Structure	B1 Structure	264	Fungus			1	0.01
5	Structure	B1 Structure	264	Indeterminable			7	0.06
5	Structure	B1 Structure	264	Nutshell	*Carya* sp.	Hickory	55	0.45
5	Structure	B1 Structure	264	Nutshell	Juglandaceae	Hickory/walnut family	7	0.02
5	Structure	B1 Structure	264	Nutshell	*Quercus sp.*	Acorn	2	0.02
5	Structure	B1 Structure	264	Rachis	*Zea mays*	Corn	1	0.01
5	Structure	B1 Structure	264	Wood	*Pinus* sp.	Pine	4	0.02
5	Structure	B1 Structure	264	Wood	*Quercus* subg. *Lobatae*	Red group oak	5	0.03

Liters processed	Feature type	Feature	Lot number(s)	Plant part	Botanical name	Common name	Count	Weight (g)
5	Structure	B1 Structure	264	Wood	*Acer* sp.	Maple	6	0.06
5	Structure	B1 Structure	264	Wood	*Quercus* subg. *Quercus*	White group oak	2	0.01
5	Structure	B1 Structure	264	Wood	*Carya* sp.	Hickory	3	0.02
5	Structure	B1 Structure	264	Wood	Not examined	Not examined	7	0.02
5	Structure	B1 Structure	264	Wood*	*Pinus* sp.	Pine	2	0.01
5	Structure	B1 Structure	265	Bark			1	0.01
5	Structure	B1 Structure	265	Fungus			6	0.03
5	Structure	B1 Structure	265	Indeterminable			20	0.09
5	Structure	B1 Structure	265	Nutshell	*Carya* sp.	Hickory	61	0.49
5	Structure	B1 Structure	265	Nutshell	Juglandaceae	Hickory/walnut family	10	0.03
5	Structure	B1 Structure	265	Rachis	*Zea mays*	Corn	2	0.01
5	Structure	B1 Structure	265	Wood	*Pinus* sp.	Pine	5	0.07
5	Structure	B1 Structure	265	Wood	*Acer* sp.	Maple	2	0.02
5	Structure	B1 Structure	265	Wood	*Quercus* subg. *Lobatae*	Red group oak	9	0.12
5	Structure	B1 Structure	265	Wood	*Juglans nigra*	Black walnut	1	0.02
5	Structure	B1 Structure	265	Wood	*Quercus sp.*	Oak	3	0.02
5	Structure	B1 Structure	265	Wood	Not examined	Not examined	134	0.57
5	Structure	B1 Structure	267	Bark			2	0.01
5	Structure	B1 Structure	267	Fungus			2	0.01
5	Structure	B1 Structure	267	Indeterminable			10	0.03
5	Structure	B1 Structure	267	Nutshell	*Carya* sp.	Hickory	116	0.89
5	Structure	B1 Structure	267	Nutshell	Juglandaceae	Hickory/walnut family	12	0.05
5	Structure	B1 Structure	267	Nutshell	*Quercus sp.*	Acorn	4	0.01
5	Structure	B1 Structure	267	Petiole	*Pinus* sp.	Pine	1	0.01
5	Structure	B1 Structure	267	Seed	*Zea mays*	Corn	1	0.02
5	Structure	B1 Structure	267	Seed	Indeterminable	Starchy fragments	1	0.01
5	Structure	B1 Structure	267	Wood	*Pinus* sp.	Pine	11	0.09
5	Structure	B1 Structure	267	Wood	Hardwood	Hardwood	5	0.09
5	Structure	B1 Structure	267	Wood	*Carya* sp.	Hickory	4	0.02
5	Structure	B1 Structure	267	Wood	Not examined	Not examined	362	1.45
5	Structure	B1 Structure	267	Wood*	*Pinus* sp.	Pine	19	0.19

Liters processed	Feature type	Feature	Lot number(s)	Plant part	Botanical name	Common name	Count	Weight (g)
5	Structure	Block 3	274	Nutshell	Juglandaceae	Hickory/walnut family	3	0.01
5	Structure	Block 3	274	Wood	*Pinus* sp.	Pine	1	0.01
5	Structure	Block 3	274	Wood	*Quercus* subg. *Lobatae*	Red group oak	1	0.01
4	Structure	B1 Structure	339	Bark			16	0.08
4	Structure	B1 Structure	339	Indeterminable			8	0.04
4	Structure	B1 Structure	339	Nutshell	*Carya* sp.	Hickory	39	0.55
4	Structure	B1 Structure	339	Nutshell	Juglandaceae	Hickory/walnut family	6	0.06
4	Structure	B1 Structure	339	Nutshell	*Quercus sp.*	Acorn	2	0.01
4	Structure	B1 Structure	339	Rachis	*Zea mays*	Corn	2	0.01
4	Structure	B1 Structure	339	Seed	[illegible] *mays*	Corn	1	0.01
4	Structure	B1 Structure	339	Wood	*Quercus sp.*	Oak	3	0.09
4	Structure	B1 Structure	339	Wood	*Acer* sp.	Maple	1	0.01
4	Structure	B1 Structure	339	Wood	*Carya* sp.	Hickory	11	0.35
4	Structure	B1 Structure	339	Wood	*Quercus* subg. *Quercus*	White group oak	2	0.04
4	Structure	B1 Structure	339	Wood	*Pinus* sp.	Pine	3	0.03
4	Structure	B1 Structure	339	Wood	Not examined	Not examined	91	0.73
4	Structure	B1 Structure	339	Bark*			3	0.02
4.5	Structure	B1 Structure	373	Indeterminable			9	0.05
4.5	Structure	B1 Structure	373	Nutshell	*Carya* sp.	Hickory	95	0.80
4.5	Structure	B1 Structure	373	Nutshell	Juglandaceae	Hickory/walnut family	12	0.12
4.5	Structure	B1 Structure	373	Nutshell	*Quercus sp.*	Acorn	7	0.03
4.5	Structure	B1 Structure	373	Rachis	*Zea mays*	Corn	1	0.01
4.5	Structure	B1 Structure	373	Seed	Vitaceae	Grape family	1	0.01
4.5	Structure	B1 Structure	373	Wood	*Pinus* sp.	Pine	9	0.07
4.5	Structure	B1 Structure	373	Wood	*Quercus* subg. *Quercus*	White group oak	4	0.02
4.5	Structure	B1 Structure	373	Wood	*Juniperus virginiana*	Eastern redcedar	4	0.06
4.5	Structure	B1 Structure	373	Wood	Softwood	Softwood	1	0.02
4.5	Structure	B1 Structure	373	Wood	*Quercus* sp.	Oak	2	0.02
4.5	Structure	B1 Structure	373	Wood	*Liquidambar styraciflua*	Sweetgum	1	0.01
4.5	Structure	B1 Structure	373	Wood	Not examined	Not examined	118	0.52
4**	Unit fill	TU 1, E 1/2	450.3	Indeterminable			9	0.07

Liters processed	Feature type	Feature	Lot number(s)	Plant part	Botanical name	Common name	Count	Weight (g)
4**	Unit fill	TU 1, E 1/2	450.3	Nutshell	*Carya* sp.	Hickory	25	0.33
4**	Unit fill	TU 1, E 1/2	450.3	Nutshell	Juglandaceae	Hickory/walnut family	7	0.03
4**	Unit fill	TU 1, E 1/2	450.3	Nutshell	*Quercus sp.*	Acorn	1	0.01
4**	Unit fill	TU 1, E 1/2	450.3	Rachis	*Zea mays*	Corn	1255	22.94
4**	Unit fill	TU 1, E 1/2	450.3	Rachis (cob frag.)	*Zea mays*	Corn	1	0.85
4**	Unit fill	TU 1, E 1/2	450.3	Seed	*Zea mays*	Corn	1	0.01
4**	Unit fill	TU 1, E 1/2	450.3	Wood	*Quercus* subg. *Lobatae*	Red group oak	13	0.19
4**	Unit fill	TU 1, E 1/2	450.3	Wood	Hardwood	Hardwood	5	0.04
4**	Unit fill	TU 1, E 1/2	450.3	Wood	*Quercus* subg. *Quercus*	White group oak	2	0.03
4**	Unit fill	TU 1, E 1/2	450.3	Wood	Not examined	Not examined	30	0.12
n/a	Unit fill	TU 1, E 1/2	448.3	Rachis	*Zea mays*	Corn	84	1.50

*semi-carbonized
**estimate

Appendix B. Corn cupules (*Zea mays*) from Ramos Creek (conjoined cupules only). (Bush 2011:Table B.7).

Lot #	Cupule width (mm)	Length of segment (mm)	Average cupule thickness (mm)	Comments
448.3	8.3	9.1	3.03	
	8.0			
	8.6			
	8.6	10.6	3.53	
	8.7			
450.3	7.5	8.2	4.10	12-row cob
	7.3			
	8.6	10.6	3.53	12-row cob
	8.7			
	8.8			
	7.7	12.1	4.03	12-row cob
	7.8			
	7.7			
	7.6	6.0	3.00	12-row cob
	7.6			
	5.8	9.9	3.30	
	6.1			
	5.8			
	6.2	8.2	2.73	
	6.2			
	5.7			
	5.9	18.9	2.70	conjoined with next rank
	6.4			
	6.2			
	6.4			
	5.5			
	6.2			
	6.0			
	6.0	15.0	2.50	conjoined with previous rank
	6.0			
	6.2			
	5.6			
	5.8			
	5.8			
	7.9	20.6	3.43	
	8.0			
	7.5			
	7.4			
	6.4			
	6.5	12.5	3.13	
	6.8			
	7.0			
	6.6			
	6.0	18.3	2.61	

Lot #	Cupule width (mm)	Length of segment (mm)	Average cupule thickness (mm)	Comments
	6.6			
	6.5			
	6.3			
	6.8			
	6.2			
	6.4			
	6.3	15.25	3.05	
	6.4			
	6.7			
	6.2			
	6.2			
	6.5	10.2	3.40	
	6.4			
	6.1			
	6.7	13.25	3.31	
	7.1			
	7.4			
	7.2			
	7.1	5.7	2.85	
	7.2			
	6.8	5.4	2.70	
	7.3			
	6.4	8.2	2.73	
	6.7			
	6.0			
314, 386, 394 (Fea. 5)	6.1	6.0	3.00	conjoined with next rank
	6.0			
	5.9	6.2	3.10	conjoined with previous rank
	5.8			
(Fea. 103)	6.0	6.2	3.10	12-row cob
	6.6			
	4.3	9.5	3.17	12-row cob
	4.8			
	5.0			
	5.5	13.8	3.45	12-row cob
	6.0			
	6.2			
	5.8			
	5.9	10.2	3.40	12-row cob
	5.8			
	5.9			
	5.8	13.4	3.35	12-row cob
	5.6			
	5.6			
	6.0			
	4.8	9.5	3.17	12-row cob
	4.8			
	4.0			

Appendix C. Summary data on corn cupules (*Zea mays*) from Ramos Creek (conjoined cupules only). (Bush 2011:Table B.7).

Provenience	Average width (mm)	Average thickness (mm)
Site total	6.51	3.12
448.3 only (hand collected sample)	8.43	3.28
All excepting 448.3	6.40	3.11

Appendix D. Radiocarbon Dates from additional sites along the Mountain Fork (Perttula and Nelson 2004).

Site Name	Site #	Lab #	AMS or Radiometric	Conventional Radiocarbon Age (BP)	13C/12C Ratio	2 Sigma Calibration (AD)*	Provenience
Buffalo Creek	34MC402	Beta-167247	AMS	1020 ± 40	-24.9 o/oo	897-1153	Unit 10, 20-30 cmbs, nutshell
Buffalo Creek	34MC402	Beta-167248	AMS	1630 ± 40	-25.6 o/oo	267-540	Unit 10, 50-60 cmbs, nutshell
--	34MC835	Beta-167249	AMS	1450 ± 40	-24.5 o/oo	546-656	Unit 3, 50-60 cmbs, nutshell
--	34MC835	Beta-167250	AMS	770 ± 40	-24.3 o/oo	1185-1289	Unit 8, 10-20 cmbs, nutshell
--	34MC838	Beta-167251	AMS	1770 ± 40	-26.0 o/oo	134-380	Unit 1, 60-70 cmbs, nutshell
--	34MC838	Beta-167252	AMS	1430 ± 40	-25.9 o/oo	559-663	Unit 1, 50-60 cmbs, nutshell
Hudson Creek	34MC848	Beta-167253	AMS	1140 ± 40	-25.6 o/oo	779-987	Unit 6, 20-30 cmbs, nutshell
Hudson Creek	34MC848	Beta-167254	AMS	2520 ± 40	-25.9 o/oo	(797-517 BC/ 2746-2466 BP)	Unit 7, 40-50 cmbs, nutshell
--	34MC849	Beta-167255	AMS	370 ± 40	-23.7 o/oo	1446-1635	Unit 6, 20-30 cmbs, nutshell
--	34MC849	Beta-167256	AMS	1910 ± 40	-25.3 o/oo	5-216	Unit 1, 30-40 cmbs, nutshell

*Calibrated with IntCal09 curve using OxCal 4.1 (Bronk Ramsey 2009).

Appendix E. Radiocarbon dates from additional sites along the Mountain Fork (Sundermeyer et al. 2004)

Site Name	Site #	Lab #	AMS or Radiometric	Conventional Radiocarbon Age (BP)	13C/12C Ratio	2 Sigma Calibration (AD)*	Provenience
--	34MC425	Beta-187390	Radiometric	560 ± 50	-23.9 o/oo	1298-1437	TU2, 21-31 cmbs, charred material
--	34MC837	R28444/1	AMS	126 ± 35	-26.1 o/oo	1675-1942	F1, 14-26 cmbs, charcoal
--	34MC837	R28444/2	AMS	7287 ± 40	-33.6 o/oo	(6227-6067 BC/ 8176-8016 BP)	F2, 46-56 cmbs, sediment

*Calibrated with IntCal09 curve using OxCal 4.1 (Bronk Ramsey 2009).

Appendix F. Photographs of whole vessels from non-burial contexts.

Hudson Engraved bottle from Biggham Creek (34Mc105/5).

Jar from E. Johnson (34Mc54/439), variant of Dah-wat Incised, partially reconstructed.

Jar from E. Johnson (34Mc54/207), possible variant of Harleton Applique.